APRIL 1956

Contractors and Engineers

magazine of modern construction

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SCIENCES

Gradall® REMOVES 2400 FEET OF CURB AND SIDEWALK PER DAY!

Gradall loosens, lifts and loads curb sections intact, grasping curb firmly against boom with its hydraulic bucket "wrist" action.

First step. Gradall smoothly breaks out and loads large 4 to 5-foot sections of asphalt sidewalk.

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THAT'S THE AVERAGE turned in on this 120,000-foot San Diego job by the R. E. Hazard Contracting Company. By the two previous methods used, 800 to 1000 feet a day was considered very good.

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Supt. Wayne W. Wallace states: "There is no way at all you can take it out cheaper than with a Gradall."

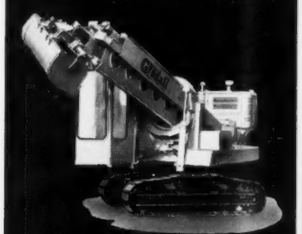
Since delivery in December, 1954, Hazard's Gradall has averaged over 200 on-the-job hours every month! They keep this multi-purpose machine busy on a wide variety of jobs—often on work no other machine could touch, jobs where Gradall's power and arm-action accuracy really pay off.

Find out exactly how a Gradall can cut costs for you. Arrange a field demonstration now with your nearest Gradall Distributor.

® Reg. U. S. Pat. Off.

Then Gradall digs out behind curb prior to removal. It works easily under low wires or trees.

THREE OTHER GRADALL MODELS . . . one that best suits your needs!



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SELF-PROPELLED GRADALL

RAILROAD GRADALL

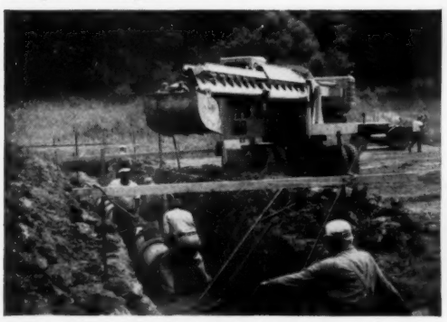
See your nearest Gradall Distributor for a field demonstration!

GRADALL CUTS COSTS ON MANY OTHER JOBS

Turnpike construction — Peter Salvucci, Inc., Waltham, Mass., has kept this Gradall busy on many phases of New Hampshire Turnpike.

Ditching — Gradall shows its accurate arm-action digging this ditch along new highway. Contractor: Cherokee, Inc., Columbia, S. C.

Road Widening — Great Lakes Construction Company's Gradall speeded digging and curb removal job, with traffic maintained, on Cleveland job.



Setting pipe — After digging ditch, Ralph Myers Contracting Company, Monroeville, Pa., uses Gradall's accurate arm-action to set concrete pipe.

Materials handling — Gradall owned by John G. Verington, Benton Harbor, Michigan, loads gravel into truck on this highway project.

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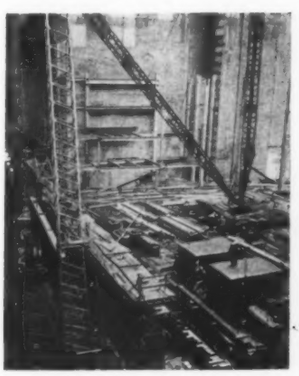

Steel erection. Pg. 130

editorial

Green light for the Colorado

When Congress last month approved the spending of $760 million for the construction of dams and storage reservoirs in the Upper Colorado River basin, it insured the development of a region that has long been hampered by lack of water. The Upper Basin is an intermountain area, including portions of Colorado, Wyoming, Utah, New Mexico, and Arizona, and totals more than 110,000 square miles. This sparsely settled arid region, with a a rainfall averaging less than 10 inches a year, can use the water that is produced in abundance from heavy snowfalls in the high peaks of the Rockies.

Heretofore, that water has been wasted. Under this new program, three big dams feeding about a dozen irrigation projects will impound the Colorado and its tributaries to provide initial irrigation of 132,000 acres of new land, and supplemental irrigation of 234,000 acres of other land. The plan will increase the yearly water supply of these western states about 1½ million acre-feet—60 per cent more than is now taken from the Colorado. With this multipurpose project, the power capacity of the Upper Basin will be increased fivefold, approximately 872,000 kilowatts of hydroelectric power being generated at two of the dams.

New industries, with water and power assured, will undoubtedly move into this region that is rich with some of the nation's great deposits of uranium, oil, gas, titanium, coal, vanadium, and other raw materials. Until the present, these resources could never properly be tapped because of an insufficient supply of power and water.

Recreation, too, should be another useful by-product of this master river development once the vast reservoirs are filled and roads are built to them. Hoover Dam, on the lower Colorado, will have its life lengthened when the flow of the river is under control in the Upper Basin. Silting in Lake Mead, which results in a pile-up of huge deposits behind the dam, will be appreciably reduced.

The $760 million now authorized is only for the first phase of the project, which eventually may cost billions. The development will be on a par with plans that have already been realized on the Lower Basin of the Colorado, the Missouri, and the Tennessee river under the TVA.

Plans will naturally be slow to materialize. Construction of the three big dams—Glen Canyon on the Colorado, Flaming Gorge on the Green, and Navajo on the San Juan river—will take at least eight years. A fourth dam, Curecanti, on the Gunnison river, has tentative approval. Another ten years will be needed to fill the reservoirs, and a decade or two more to complete all the irrigation projects.

Considerable opposition was overcome before Congress gave its approval to this integrated river-valley plan. Southern California showed an understandable lack of enthusiasm for a project that might deprive that area of some of its share of the Colorado's water. Unsuccessful proponents of a federal dam at Hell's Canyon in the Columbia River basin (see editorial C&E October, 1955, pg. 4) still grumble about public development of the upper Colorado. But these two situations are far from identical. Hell's Canyon on the Snake river near the Idaho-Oregon border is a project that the Idaho Power Co., a private enterprise, is willing and able to finance for about $250 million. The development of the Upper Colorado Basin is essentially a public project that only the federal government can undertake as a whole and not as a number of small, isolated units. Only the financial backing of the government can see to completion a project that will tap the hidden resources of this desert-like region, turning it into a mountain oasis. This is no local project. The entire country has a stake in the region's reclamation and development.

Radio and television give an electronic-age aspect to concrete placing operations at Table Rock Dam near Branson, Mo. Big windows in the rolling control tower permit the cableway operator to keep the Gar-Bro 8-yard bucket in view as it swings out over the valley. The RCA closed-circuit TV system lets him see equipment working in the head tower half a mile away. He gets directions for spotting the bucket, via Motorola short-wave radio, from a signalman at the placement site. G-E controls actuate the cableway. Page 80.

CONTRACTORS AND ENGINEERS

issued monthly by
BUTTENHEIM-DIX PUBLISHING CORPORATION

470 Fourth Ave., New York 16, N. Y.

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Field Editors • Ralph Monson, Anthony N. Mavroudis
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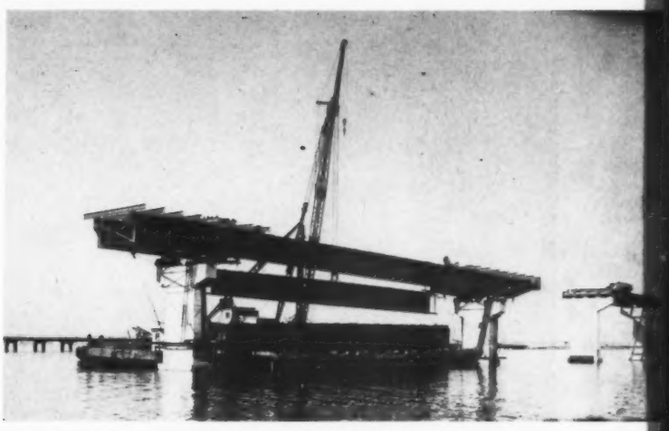
Acceptance under Section 34.64 P. L. & R. Authorized at Lancaster, Pa. Vol. 53, No. 4
$4 a year, 50 cents a copy in the United States and Canada. $7 a year in other countries.

Floating stiffleg sets steel for last of 282 Parkway spans



The 75-ton-capacity stiffleg prepares to set the next-to-last pair of middle girders for the Great Egg Bay Bridge. Weighing 63 tons each, the girders will be fastened to stub ends of the girder sections on the far side of the piers.

Instead of using a traveler and falsework, Bethlehem Steel Co., Bethlehem, Pa., had a derrick boat with a 75-ton-capacity stiffleg derrick set heavy girder and beam spans for the Great Egg Bay Bridge—the last of the 282 bridges built on the $300 million Garden State Parkway in New Jersey.

By using the derrick, with its 43-foot mast and 90-foot boom, and by using high-strength bolts as field fasteners on beam spans, Bethlehem cut erection time considerably for the 3,671-foot bridge just west of Ocean City, N. J.

Bethlehem first erected the short pier girder sections—most of which were 56 feet long. These, with cross frames, lateral bracing, and floor beams, were balanced on rocker or fixed shoes on the concrete T-piers and temporarily braced with ⅞-inch diameter wire-rope guys with turnbuckles. The guys were attached to a rectangular steel frame at the base of the pier.

At the end of each pier, a steel column was used under the pier cap to prevent the bracing frame from rising. The pier caps have sloping surfaces on the underside, and for this reason, a short section of WF beam, with two 1¼-inch-diameter and 18-foot-long tie rods were used to hold the columns in place.

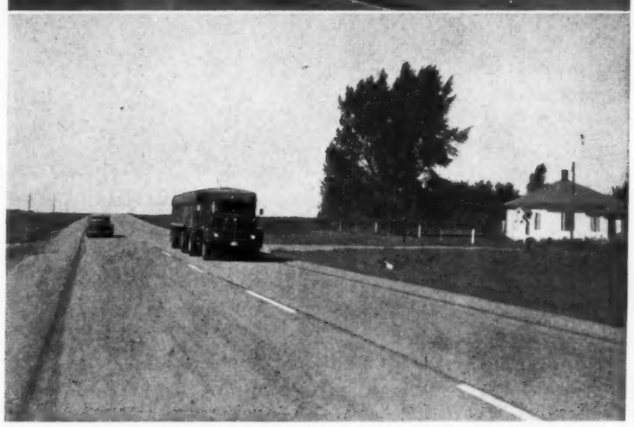
The pier girders were adjusted to the proper slope before the 128-foot middle girders were slipped into place. These girders, 9 feet deep and weighing up to 63 tons, were hoisted into place 26 to 45 feet above mean high water by the 75-ton-capacity stiffleg. A second derrick boat, this one with a 16-foot stiffleg derrick having a 24-foot mast and 70-foot boom, set up the bracing frames on the piers. Bracing and floor steel were erected after both middle girders had been placed, pinned, and bolted.

Altogether, the steel work of the new bridge is 2,730 feet long. Including the 14 beam spans, it weighs a total of 2,500 tons. A concrete viaduct at each end of the bridge connects it to the south abutment at Beesley's Point and to Drag Island. Another stretch of concrete viaduct, 762 feet long, connects Drag Island with Somers Point on the north shore of the bay.

With the completion of this bridge, the only remaining work to be done on the 165-mile parkway running from Cape May to Paramus, is a three-mile stretch of paving.

Steel erection for the Great Egg Bay Bridge was done by Bethlehem's Eastern Erection District, with G. P. Bullard, manager of erection. John Piper was field engineer for Bethlehem, C. W. Leatherman was superintendent, and James Richardson was field supervisor. THE END

Spreading a highway's cost over a 10 year period



Paving 20 miles of South Dakota's Route 25 with an intermediate type of Texaco Asphalt construction, described in column at the right.

South Dakota completed the first stage of this 20-mile highway project in 1955, using an intermediate type of Texaco Asphalt pavement. Approximately 10 years from now, a hot-mix asphalt surface will be added, strengthening the original pavement and giving it a new lease on life.

By this stage construction method of building roads with Texaco asphalt products, traffic is adequately served at all times, while cost is distributed over the years.

The first stage of the South Dakota project consists of a 9-inch gravel base, primed with Texaco Slow-curing Asphaltic Oil. A plant-mixed Texaco asphalt surface of the cold-laid type was constructed on the base to a compacted thickness of two inches, followed by a seal coat of Texaco Rapid-curing Cutback Asphalt and sand cover.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils provide the road builder with a variety of heavy-duty, intermediate and low-cost types of construction for highways, streets, toll roads, airports, etc. Helpful information regarding all of these types is supplied in two booklets which can be secured without obligation by writing our nearest office.

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TEXACO ASPHALT

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The paper boxes are assembled and placed for a pour. Many of the boxes fall out of the slab as concrete dries, while the rest are stripped easily.

Paper box forms help cut cost of warehouse slabs

Presan, Lift-Slab methods, and cardboard forming system keep total cost of facility well within owner's budget

A forming system using paper boxes, and a combination of building techniques, brought the total price of the completed shell of the Los Angeles warehouse of the Thrifty Drug Co. to only $2.77 per square foot. And even adding $1.25 per foot to this cost—for the finish of the building and such mechanical installations as elevators and a spur track—the cost of the new warehouse was within the limit set by the owner.

The use of precast-concrete wall panels, columns of tubular steel rolled square and filled with concrete to support second-floor slabs, flange columns to support the steel roof framing, and gypsum board poured on the insulation formboard, helped to keep expenses down. But the most important saving was made in the construction of the second-floor slabs for the two-story structure. A total of 22 of these slabs, each with an average area of about 7,000 square feet and of coffered design, were formed on the ground-floor slab with cardboard-box forms.

Several innovations used

Similar methods have been used before, but this job included several innovations. Albert C. Martin & Associates, Los Angeles, Calif., worked out the techniques, which were practically applied by William Simpson Construction Co., also of Los Angeles.

Before they tackled the problem, plans for a conventionally designed and built warehouse had been submitted and rejected as being too costly. These plans, for a warehouse containing almost eight acres of floor space, would have made construction exceed the owner's budget by some $200,000.

Several techniques were combined by the Martin and Simpson firms so that costs could be scaled down without lowering the quality of the completed work. Then both the architect and the contractor held early consultations with the owner—meetings which also helped to increase savings for this job.

New design process

Concrete slabs were designed through photo-reflective stress analysis of a scale model. This process, recently developed by the Presan Corp., made it possible to decide on a de-

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- Light weight . . . completely portable
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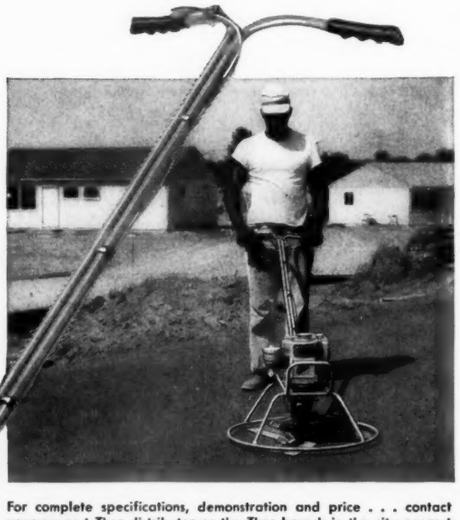

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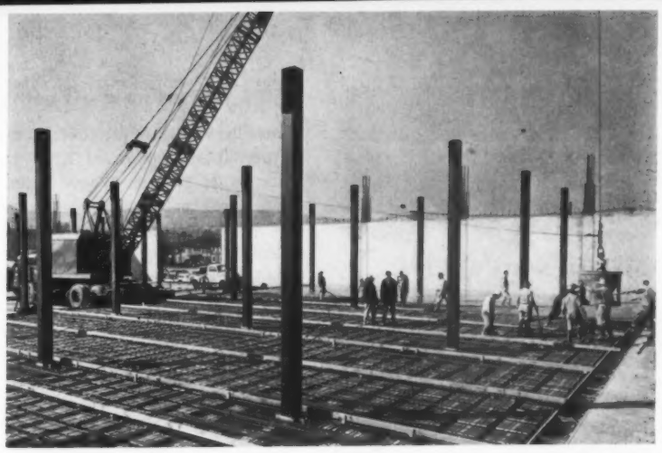

A truck crane places concrete for one of the second-story slabs. The paper boxes used to form the wells in the underside of the slab are sufficiently strong to support reinforcing, lumber, and other equipment.

sign that provided a maximum amount of strength for the minimum weight of material used. Though the first-floor columns in the new structure are 24 feet apart, the second floor has been built strong enough to support live loads of 200 pounds per square foot.

The Simpson firm, working with the California Container Corp., formed and poured sample slabs in its warehouse, finally devising the method of using carboard boxes with egg-crate inserts to form wells in the slabs.

Made-to-order forms

The forms used on this job were made to order, delivered flat to the job site, and assembled quickly and placed in position for a pour. They easily bore all the weight of all necessary reinforcing and equipment. Ready-mix concrete was bucketed to the slab forms by a truck crane.

When the slabs had been raised into place by the vagtborg Lift-Slab Corp., their underside resembled a huge waffle. One advantage of the paper box forms was that many of them fell out of the slab as the concrete dried, while the remainder were easily stripped. They also made the concrete so smooth that no additional finish was necessary. THE END

Howes named manager of Western Knapp Engineering

The new manager of Western Knapp Engineering Co., a division of Western Machinery Co., San Francisco, Calif., is Warren L. Howes. He has been associated with Western in a number of supervisory capacities since 1948.

The firm has also received an award from the Accident Prevention Committee of the Associated General Contractors in recognition of the 105,000 accident-free hours reported by its Hibbing, Minn., district office.

LeTourneau-Westinghouse to expand certification

The certified-operator program started 15 years ago by LeTourneau-Westinghouse Co., Peoria, Ill., as an in-service training program, has been enlarged to include operators of the Adams motor grader.

BIGGER PAYLOADS AND FASTER CYCLE TIMES FOLLOW THIS No. 12

on the northeastern extension of the Pennsylvania Turnpike

Marsolino Construction Company, Uniontown, Pa., is making efficient use of big yellow equipment on the Norristown-Scranton extension of the Pennsylvania Turnpike. Among the Caterpillar units in its line-up are five DW21s hauling, three D8s bulldozing, two D8s push-loading and two No. 12s grading haul and access roads. This use of the No. 12s enables Marsolino to get even bigger production from the high-speed, big-capacity CAT* DW21s.

On contract after contract where money-making performance calls for long hauls on wheels, the maintenance of haul roads by motor graders results in bigger payloads and faster cycle times. The fast-working No. 12 has proved itself ideal for this purpose. Operators like its easy, accurate steering, positive action of mechanical controls and quick blade positioning without leaving the platform. And the unobstructed vision allows them to see the job while seated.

On this job, Caterpillar-built equipment is working 9½ hours a day, 6 days a week. A. J. Marsolino says: "Modern highway building requires a huge investment in heavy equipment. We believe in buying the best. We know from experience the best buy is Caterpillar. That's why we have standardized on it for our earthmoving and grading. Down time is a minor item but when we do have it, the parts service is excellent."

A minimum of down time and efficient, one-stop parts service—these are just two of many reasons it pays to standardize on Caterpillar. For the complete data on every earthmoving unit from graders to scrapers, see your nearby Caterpillar Dealer.

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USE CAT EQUIPMENT FOR MONEY-MAKING PERFORMANCE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 204

names in the news

BTEA re-elects officers

The Building Trades Employers' Association, an organization of 1,000 building contractors in metropolitan New York, has re-elected William B. F. Drew president of the organization.

William B. F. Drew, re-elected president of the Building Trades Employers' Association of New York City.

Mr. Drew is the secretary-treasurer of J. L. Murphy, Inc., general piping contractor.

Re-elected with Mr. Drew were Joseph A. Courter, president of Courter & Co., Inc., vice president; William N. Angus, president of William Angus, Inc., second vice president; and Eugene McGovern, vice president of Halloran & Narr, Inc., third vice president.

J. W. Zucker, president of the Shatz Painting Co. was re-elected treasurer, and W. Arthur Riehl was reappointed secretary.

Corps of Engineers reassigns three officers

Three engineer officers have been assigned to new posts by the U. S. Army Corps of Engineers. Brig. Gen. David H. Tulley, assistant chief of engineers for military construction since 1953, will become commanding general of the Engineer Center and Fort Belvoir, Va.

Brig. Gen. Walter K. Wilson, Jr., will succeed Gen. Tulley in the military-construction post, and Brig. Gen. John H. Dudley, who is returning from Europe where he has been VII Corps Engineer, will replace Gen. Wilson.

R. H. Whitaker fills N. H. highway post

Robert H. Whitaker has taken office as deputy commissioner of the New Hampshire Public Works and Highway Department. His nomination to the position by Commissioner John O. Morton was unanimously approved by Governor Dwinell and the Executive Council.

Mr. Whitaker has been associated with the department for 21 years.

Henry M. Wasung opens office as consultant

A consulting office in general engineering has been opened by Henry M. Wasung at 65 Woodcrest Circle, Springfield, N. J. Formerly the chief estimator for the Drilled-In Caisson Corp., New York, N. Y., Mr. Wasung is a member of the American Society of Civil Engineers as well as a member of The Moles.

NSGA names new officers

Heading the list of incoming officers of the National Sand and Gravel Association is Roy E. Weaver, newly elected president of the organization. He will be assisted by vice president E. Phil Gemmer and secretary-treasurer E. K. Davison.

At the same time, the association elected a seven-man executive committee and a 39-man board of directors.

Asphalt Institute names head of district office

A new district engineering office to serve Michigan and parts of Ohio and Indiana has been opened by the Asphalt Institute, College Park, Md. John Goshorn, division engineer at Columbus, Ohio will supervise operations at the new facility.

F. H. McGraw elects new vice presidents

A. K. Ferguson, former president of the H. K. Ferguson Co., Cleveland, Ohio, has been elected a vice president of the F. H. McGraw & Co., Hartford, Conn. Actively engaged in the building field since 1923, Mr. Ferguson was also an officer of the Walter Kidde Construction Co. of New York, N. Y.

Mr. Ferguson's appointment preceded McGraw's approval of the sale of 40 per cent of its common stock to the Olin Mathieson Chemical Corp., Baltimore, Md.

A. K. Ferguson, recently elected a vice president of F. H. McGraw & Co.

Paul F. Pape, new vice president in charge of engineering.

Paul F. Pape and Charles DuBose have also been elected vice presidents. Mr. Pape will serve as vice president in charge of engineering, and Mr. DuBose will head the company's Canadian subsidiary in Toronto.

Lighten your maintenance cost load

EVEN in off-highway service, *Texaco Marfak* gives chassis parts full protection. That's because heavy loads won't squeeze it out, bumpy roads won't pound it out. You get long extra life for all chassis parts because of *Marfak's* longer lasting protection against wear and rust.

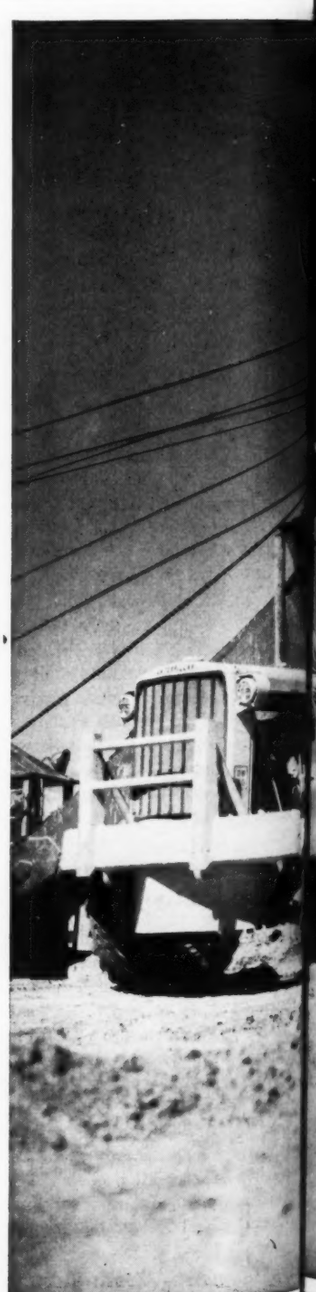
In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in to assure extra thousands of miles between lube jobs, extra long life for bearings, extra safety in braking. No seasonal change is required.

For contractors who want *just one* lubricant to handle chassis, wheel bearing, water pump and other grease lubrication, there is the new lithium-base *Texaco Marfak Heavy Duty Special 2*. It pumps easily and lubricates effectively even at winter temperatures. It resists water washing and stands up in severest service.

More than 625 million pounds of Texaco Marfak have been sold

Also use: *Texaco Track Roll Lubricant* to reduce maintenance costs of your crawler mechanisms. *Texaco Universal Gear Lubricant EP* to assure smooth functioning transmissions and differentials.

Call on Texaco Lubrication Engineering Service for help in simplifying and improving your maintenance lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



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TEXACO

TEXACO

Pennsylvania builders elect new officers

The Constructors Association of Western Pennsylvania has elected Edward McCrady, Jr., president of the organization. Mr. McCrady, president of the Edward McCrady, Jr., & Son Co., Pittsburgh, had also served on the association's board of governors and as its vice president.

Elected to serve with him were: Anthony A. Benintend, Ben Construction Co., Pittsburgh, vice president of the heavy division; Charles H. Booth, Jr., Burrell Construction & Supply Co., New Kensington, vice president of the highway division; Frank Mashuda, of the Frank Mashuda Co., Milwaukee, treasurer; Howard H. Sturdy, Dravo Corp., Pittsburgh, secretary; and Richard A. Wetzig, of Ferguson & Edmondson Co., Pittsburgh, assistant secretary.

Edward McCrady, Jr., president of the Constructors Association of Western Pennsylvania.

Elections were held during the association's second annual meeting in February.

NRMCA elects officers

New officers and board members were elected to head the National Ready Mixed Concrete Association. Robert Mitchell was elected president of the organization, with John W. Roberts and M. Eugene Sundt as vice presidents.

F. E. Schouweiler will serve as treasurer. Eight members were elected to the executive committee, and 28 members were designated for the board of directors.

H. K. Ferguson Company elects new director

The H. K. Ferguson Co., engineers and builders of Cleveland, Ohio, has elected Ralph W. Olmstead a director of the firm. Joining the Ferguson organization in 1954, Mr. Olmstead served as assistant to the president and as a vice president.

During World War II, he served as a lieutenant colonel in the Caribbean theater, and in England, France, North Africa, and Russia.

Merged southern firms appoint three officers

Three top executives have been appointed by Williams-McWilliams Industries, Inc., a new firm formed by the merger of McWilliams Dredging Co. and W. Horace Williams Co., heavy constructors, both of New Orleans, La.

President and chairman of the board of directors is Alfred A. Strelsin, former chairman of the board for McWilliams. Robert E. Gosa, former president of W. Horace Williams, will serve as executive vice president in charge of the W. Horace Williams Division.

The former president of McWilliams, Leslie R. Thornton, was made vice president in charge of the McWilliams Division.

Army develops tractor with low ground pressure

A special low-ground-pressure tractor, fabricated essentially of parts from a Caterpillar tractor and a Hyster winch, has been developed by the U. S. Army Corps of Engineers to tow trains of supplies and material over Arctic snow and muskeg. With a unit ground pressure of 3.4 psi, the tractor is powered by a six-cylinder diesel engine capable of 225 horsepower.

The unit is equipped with an extended track frame and 54-inch-wide track shoes. Standard controls, steering clutches and transmission, and a torque converter are featured.

Manufactured by the Peterson Tractor & Equipment Co., San Leandro, Calif., the unit is also available in a 195-hp model.

Port Authority releases revised harbors map

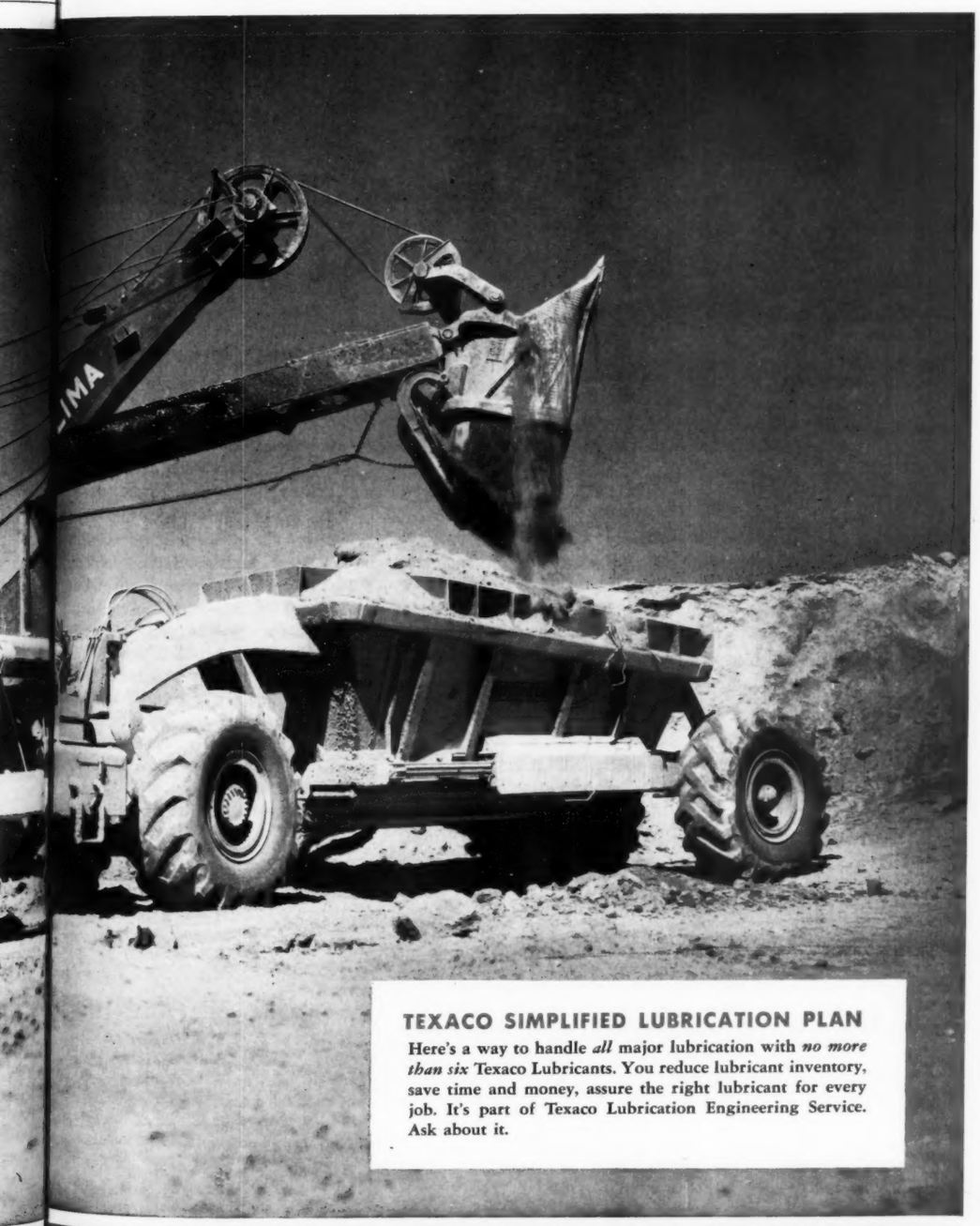
A revised and enlarged edition of its New York Harbor Terminals map has been released by the Port of New York Authority. Featuring individual strip maps of principal pier facilities in New York and New Jersey, the map incorporates about a hundred changes that have been made on the bi-state waterfront since the last edition of the map in 1952.

The map includes the existing and proposed marine terminals in Port Newark, Hoboken, Brooklyn, the Columbia Street pier, and the Brooklyn grain terminal. Rail facilities, etc., are also indicated.

The 29 × 27-inch map may be obtained from the Port of New York Authority, 111 Eighth Ave., New York 11, N. Y.

Stultz-Sickles celebrates fortieth anniversary

The Newark, N. J., welding firm of Stultz-Sickles Co. is celebrating its 40th anniversary this year. The firm specializes in the reclamation welding of manganese and carbon-steel parts worn down by impact and abrasion.



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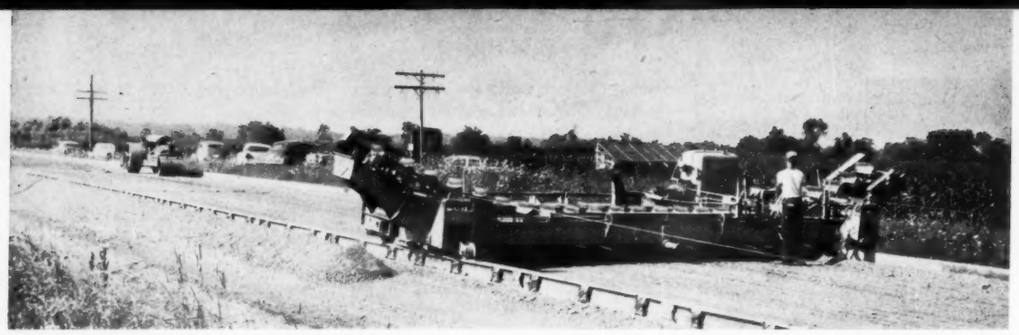
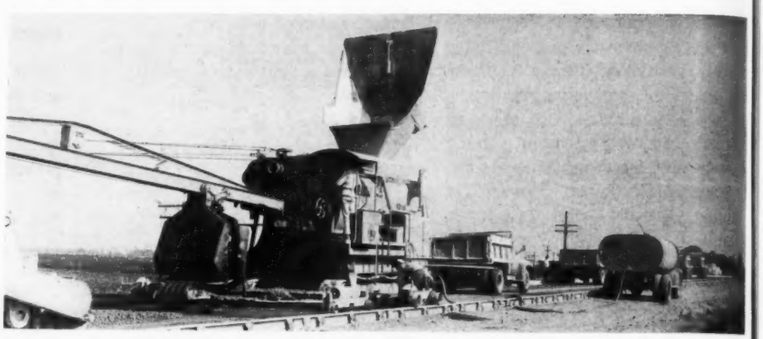


After the old blacktop has been scarified and reshaped for the new base, a Blaw-Knox subgrader brings the base to grade. Some gravel base material was used to fill depressed areas left when the blacktop was wasted.

C&E Staff Photos



The Koehring 34-E Twinbatch paver, supplied with water by a Ford 1,200-gallon-capacity truck, dumps concrete for the spreader as it unrolls the mesh reinforcing for the center joint.

A batch of concrete is placed ahead of the roll of welded wire fabric, when the paver is ready to make a 15 to 20-foot move, so that the strikeoff will bring concrete to proper grade for the installation of the mesh.

Paving spread mechanizes laydown of joint reinforcing

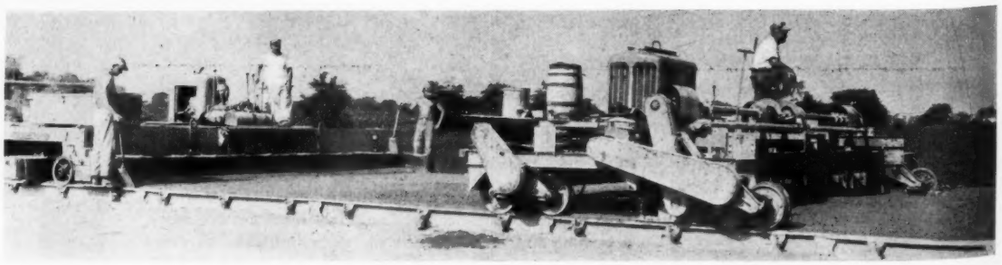
Attachment, pulled by paver, places welded wire mesh as new concrete pavement is laid over old blacktop

Changing reels is the only manual operation involved in placing the reinforcement. A rod, inserted in the center of the roll, is held by two notches on the arms projecting from the strikeoff.

Reversing the usual procedure of putting a new blacktop surface on an old concrete road, Bushman Construction Co., Baraboo, Wis., resurfaced an old bituminous concrete highway with concrete, using a paver pulling a special device that set wire mesh reinforcing for the center joint tie. This, and the need for breaking up and scarifying the old bituminous concrete, took the job out of the run-of-the-mill class.

The resurfaced 4.5-mile section of U. S. 45 runs south from Bristol, Wis., to the Illinois state line. The old road had an almost straight alignment and satisfactory grades, but its surface—probably built up in a series of road-mix operations—ranged from 3 to 20 inches in thickness and had an unsatisfactory riding quality. The new pavement, 24 feet wide and 9 inches thick, was laid directly over the old surface by Bushman, who worked under a contract with the Wisconsin State Highway Commission.

A Caterpillar No. 12 motor grader



As the paver dumps fresh concrete on the grade, a Jaeger auger-type rig spreads the concrete evenly between the forms. Close behind is a Jaeger Lakewood finisher.

A Flex-Plane jointing machine follows the finisher, installing the 3/16 × 3-inch center joint strip. Traffic delays were common through this job. Here vehicles wait on the shoulder while the water truck empties.

Aggregates are delivered to the batch plant, set up at the Bristol end of the job, by a 14-yard Winch-Lift trailer pulled by an International R-200 truck.

Two sizes of coarse aggregate and sand are proportioned from a Heltzel three-compartment 75-ton bin to the batch trucks. Cement is obtained from the Butler 150-barrel cement plant.

was used to scarify the old blacktop, which was loaded into trucks hauling to a waste area by a Caterpillar D6 tractor with a front-end loader. Gravel base material was used to fill in some of the voids and bring the stretch to proper grade for the new pavement.

After paving forms had been set in the usual manner, a Blaw-Knox subgrader, riding the forms, cut the roadway to exact grade. The subgrader deposited the excess material on the shoulders, where it was quickly bladed out by the motor grader. A limited amount of traffic originating on abutting property had to be carried through the job on the shoulders and, since these were not wide, they had to be well maintained to handle this traffic, together with batch trucks, water trucks, and other job service vehicles.

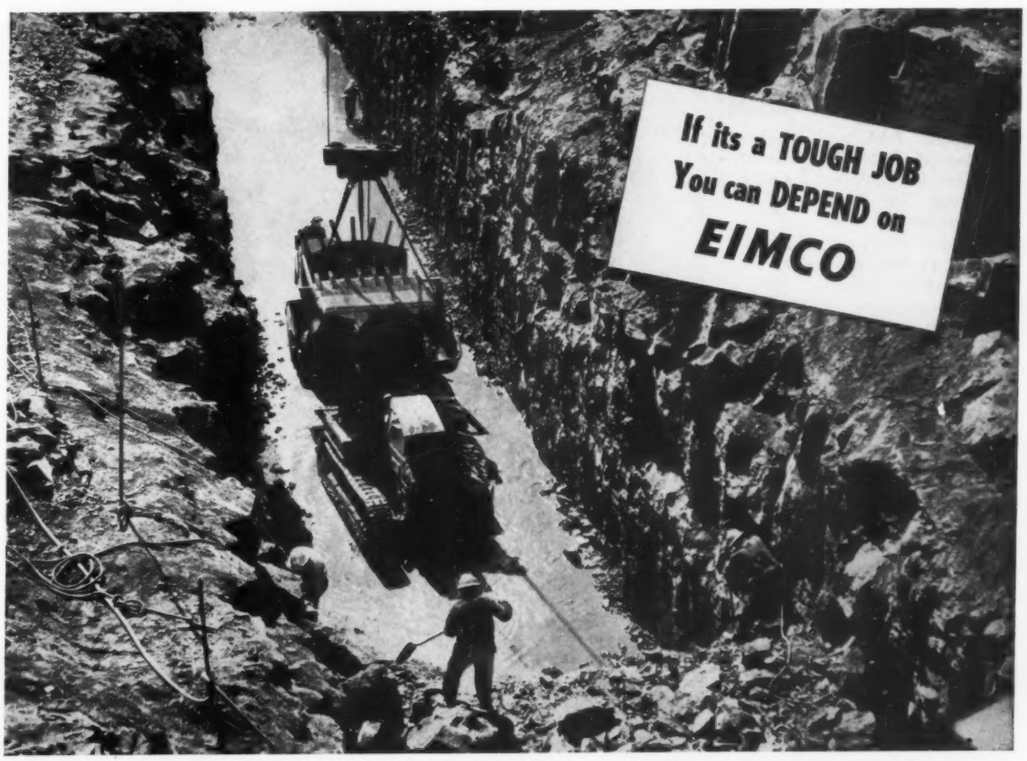
Even at best, there was a great deal of delay for the traffic moving through the job. Traffic moving in the opposite direction from the paving train followed the batch trucks and moved past the paver easily. But traffic going in the other direction was held up by water trucks serving the paver. Since the ditches were too soft and wet to support vehicles, traffic moving in this direction simply waited until the water truck was empty. Then, as the truck pulled out for a new load, vehicles that had accumulated behind it followed.

Welded mesh ties center joint

Heading the paving train was a new Koehring Twinbatch 34-E paver that traveled on the roadway between the forms and pulled the usual finegrader, plus a second device that placed the welded wire mesh for the center joint tie. This device consisted of a strike-off, set to cut the concrete to the proper level for the installation of the mesh. A pair of arms projecting out from the center of the strike-off supported the rod that held the reel of wire mesh.

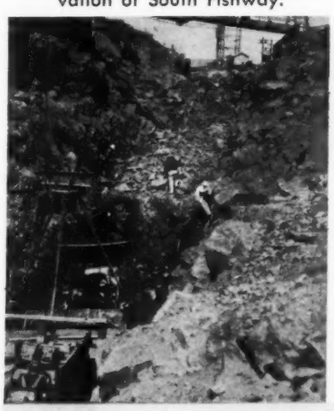
The welded wire fabric was delivered to the job in rolls 24 inches wide and 150 feet long. The mesh was No. 6 wire welded together in 6-inch squares. To start a new roll, two workmen rolled the mesh into place beside the strike-off. Inserting the rod through the roll, they lifted

(*Continued on next page*)



EIMCO KEEPS TOUGH EXCAVATION JOB ON SCHEDULE

Contractor — Montag - Halvorson - Cascade-Austin.
Location — The Dalles, Oregon.
Project — The Dalles Dam — Excavation of South Fishway.



Rock — lava basalt 91,000 cubic yards.

Report — Eimco's 105 Tractor Excavator was purchased for this job after several other types of equipment had been tried and proved either entirely unsatisfactory or incapable of maintaining the desired pace. The fishway (shown above) was excavated in lava basalt (typical of this section) with its characteristic flows and faults. Blasting in the faulted zone left many large blocky pieces of rock.

The method successfully used to excavate the shot rock from the 1500 foot long by 15 foot wide fishway channel which was 16′ deep at one end and 60′ deep at the other is as follows: A 6 yard rock ship was lowered by a crane and held in place by a Koehring Dumptor. It was loaded by the Eimco and hoisted out. "This method proved to be the most satisfactory and economical. Both machines took a terrific beating to get this job done, but to this day no one has been able to suggest a better way of doing it."

When it comes to bidding on a tough job — here are a few factors to consider: (1) Cubic yards of tough rock loaded per hour given proper haulage equipment — the Eimco will handle on a comparable basis with boom type shovels 1½ to 2 times its bucket size. (2) Cost—compare the prices. (3) Maintenance — compare these costs on jobs similar to your own. (4) Versatility — The Eimco moves quickly, easily. (5) Labor — compare the productivity per man hour.

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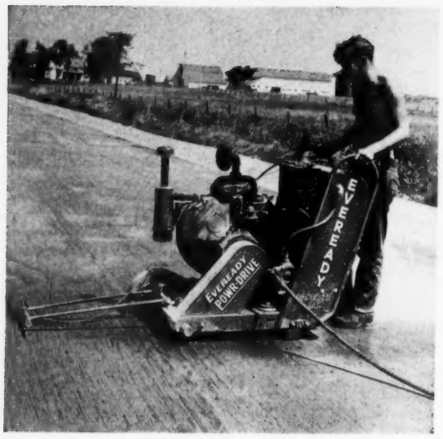


Transverse contraction joints are cut in the slab by an Eveready Powr-Drive concrete saw, a self-propelled rig with a hydraulic blade lift. Joints about 1½ inches deep were sawed about 6 hours after concrete was placed.
C&E Staff Photo

(Continued from preceding page)

the mesh up and placed the ends of the rod in two notches in the arms of the strike-off.

When he was ready for a move, the paver operator placed a bucket of concrete on the grade immediately ahead of the roll of fabric. Then, as the paver moved ahead and the strike-off spread the concrete to the proper thickness, the wire mesh unrolled in place. The mesh laid flat and appeared so perfectly placed that hand work was unnecessary. The mesh was laid continuously, though at construction joints the longitudinal wires were simply snipped with a bolt cutter.

Usually, the paver moved 15 to 20 feet at a time, depending on how the concrete spread ahead of the strike-off. The machine remained in this position while it placed the 7 to 10 batches required to carry the pavement 15 to 20 feet ahead. This operation was repeated for subsequent moves.

Batches were laid down on the grade about every 36 or 37 seconds. A Jaeger auger-type spreader distributed the concrete across the width of the roadway, and a Jaeger Lakewood finisher worked behind the spreader. The next machine in the paving train, a Flex-Plane jointing machine, installed the 3/16×3-inch bituminous center joint strip. When the joint had been installed, a new Koehring longitudinal float made the final pass, and a small amount of hand finishing completed the slab. Power spraying machines applied a coating of Mac-Seal concrete curing compound to the surface of the slab.

Used blades saw joints

About six hours after concrete had been placed, transverse contraction joints were cut at 80-foot intervals by an Eveready Powr-Drive concrete saw. This self-propelled saw with hydraulic blade lift was powered by a Wisconsin F4 air-cooled engine.

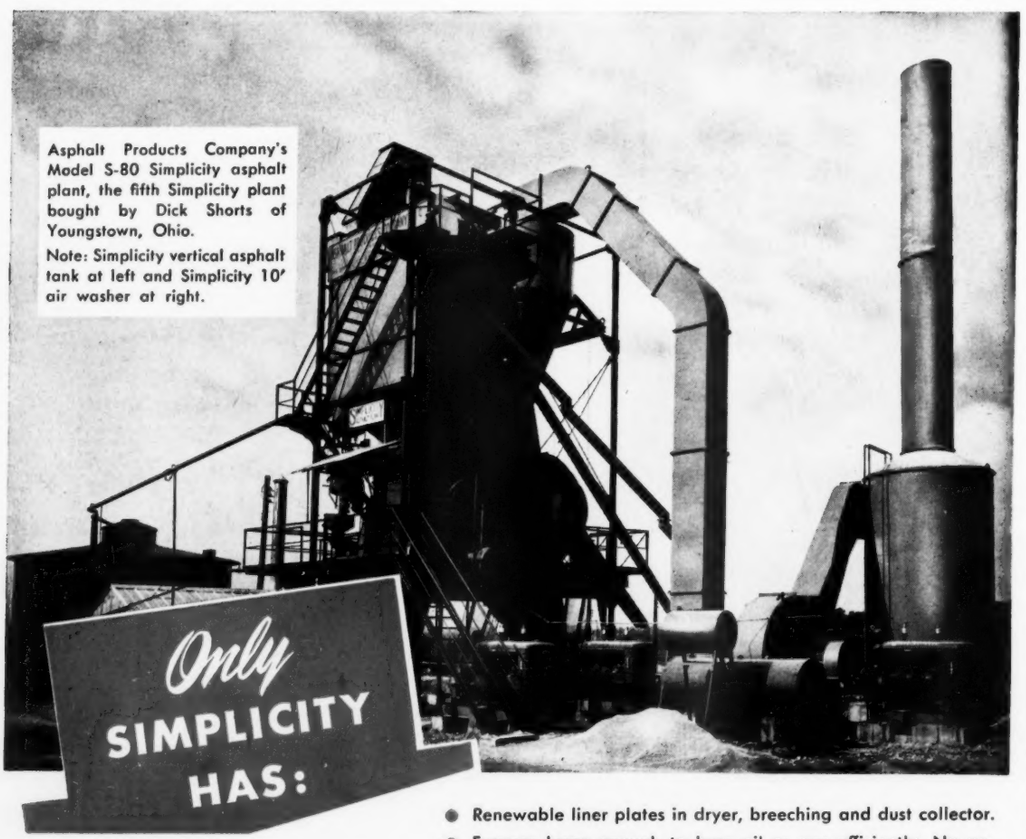
The ¼×1½-inch joint cuts were made with used Target abrasive blades that were sent to this job after having been used to cut deeper joints in an airport runway slab. The blades, worn down to about 12 inches in diameter on the first job, cut about 23 joints 1½ inches deep and 24 feet long before they were worn too small to be of further use. One new Eveready blade, used in a trial, cut 40 of the joints.

A state survey crew worked closely with the paving crew, setting section corners and quarter corners in the roadway. Cast iron plugs were inserted in the fresh concrete at the proper locations.

When the paving spread came to a crossroads that had to carry traffic, a 20-foot-wide lane was left out of the slab. When the concrete had attained enough strength, traffic was diverted over the new slab, and the 20-foot lane filled in. Wet batches of concrete for this short section were hauled back from the mixer by dump trucks, and the slab was finished by hand.

Stone, sand, and cement, dry-batched from a plant set up near Bristol at one end of the job, were hauled to the paver in rented batch trucks. Coarse aggregate consisted of two sizes of crushed stone with maximum sizes of 1½ inches and ¾ inch. These aggregates and the sand were delivered from commercial sources to the batch plant in a fleet of Winch Lift trailers.

A Northwest crane charged these materials into a Heltzel three-compartment 75-ton bin, from which the batches were weighed out to the trucks. Cement was batched from a Butler cement plant with a 150-barrel storage silo. The Marquette and Medusa air-entrained cement was shipped by rail to Trevor, Wis., and unloaded by a Butler transfer plant into three Ford covered dump trucks



Asphalt Products Company's Model S-80 Simplicity asphalt plant, the fifth Simplicity plant bought by Dick Shorts of Youngstown, Ohio.

Note: Simplicity vertical asphalt tank at left and Simplicity 10' air washer at right.

Only SIMPLICITY HAS:

- Three compartment apron type feeder bin.
- Double shell dryer. Dependable, durable and economical in operation.
- Hot or cold mix from one double shell dryer.
- Circulation of aggregates in dryer until temperature is right. No low temperature materials put into bins.
- Renewable liner plates in dryer, breeching and dust collector.
- Furnace large enough to burn oil or gas efficiently. No unburned fuel wasted on aggregates.
- Dust collector located high above dryer—minimizing load in collection system.
- Simplicity air washer—used on every make of asphalt plant in the country.
- Double-zone mixer. Fast mixing, less wear and power.
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that were kept busy on the 5-mile haul to the plant.

Water was supplied to the paver by three Ford trucks carrying 1,200-gallon tanks. The water was pumped from Lake George, located about ¼ mile off the road, by a Jaeger 3-inch pump set up at the lake.

Before the pavement was opened to traffic, the shoulders were built up to grade. All suitable material was pulled in from the edges by the Cat No. 12 motor grader to form the shoulders. Some additional gravel, hauled in, brought the shoulders to finished grade.

Personnel

Superintendent for Bushman Construction Co. was C. "Bill" Marini. Foremen of the several operations included Leo Zimmerman on paving, Fred Sass on grade, Henry Roy at the batch plant, and Henry Lutz on the curing. The project was supervised by the Milwaukee district of the Wisconsin State Highway Commission, which had Edward Staron serving as resident engineer on the job. E. L. Roettiger is state highway engineer, and S. E. Hicks is engineer of construction for the Wisconsin department.

THE END

Release new edition of Garden State Parkway map

The fifth edition of the map of the Garden State Parkway has been released by the New Jersey State Highway Authority. Printed in color, the map shows toll stations, service areas, connecting roads, U. S. highways and state and secondary routes intersecting the parkway.

Enlarged details of the map are diagrammed, and a chart of estimated tolls is given. Picnic areas and points of interest are indicated on the copy, and a brief comment is given of a few of the sites along the route.

Copies of the map may be obtained from the Public Relations Office, Garden State Parkway, 12 Broad St., Red Bank, N. J.

Pa. highway department makes four appointments

In a series of four personnel changes within the Pennsylvania Department of Highways, Robert F. Riley was appointed Scranton district engineer. He will be assisted by Anthony J. Walsh.

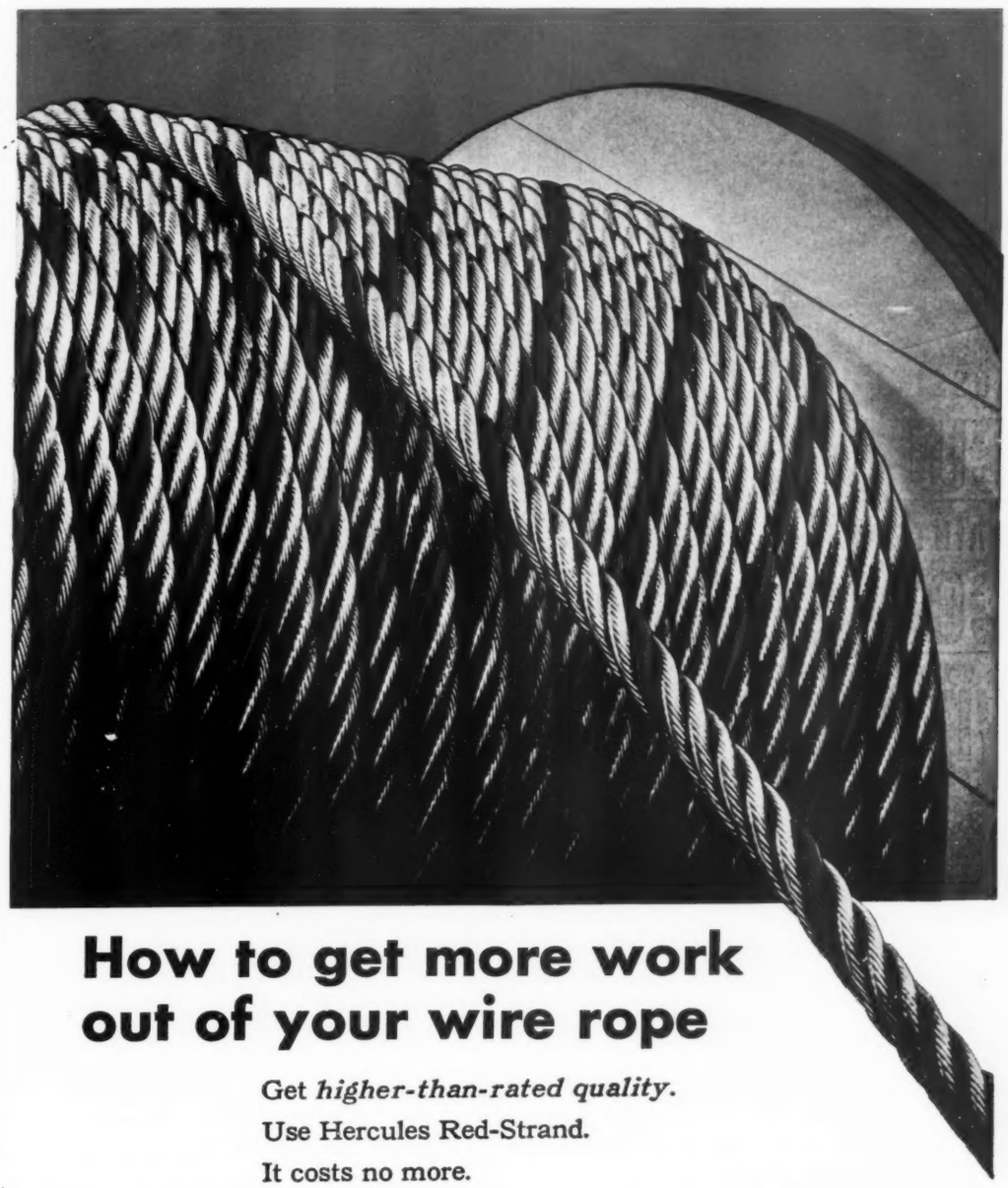
James Whalen will serve as district maintenance engineer and Thomas Harrington as district construction engineer. The four men will work under the direction of highway secretary Joseph J. Lawler.

Puerto Rico starts river-diversion project

Work is under way on the diversion of the Puerto Nuevo River in the first phase of a long-range project to improve the port of San Juan, Puerto Rico. The $16 million job is part of a $67 million project scheduled for completion in 1980.

Long-range plans include berths for 15 ships, warehouses, and a market.

WORKMEN PREPARE to insulate a section of the 14-inch seamless pipe that will carry heat to buildings at the $100 million U. S. Air Force Strategic Air Base at Plattsburg, N. Y. The Jones & Laughlin pipe, able to withstand a 600-pound hydrostatic pressure, is being laid by Coffey & Teachout, Colchester, Vt.



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Asphalt emulsion stabilization

. . . requires procedures be suited to job conditions; various techniques are currently in use in New York State

by JOHN A. DOW, eastern representative,
K. E. McConnaughay, Lafayette, Ind.

Over the course of years, every sphere of work becomes more specialized. Today in every part of the country, different methods of road construction are being used, but in each case, the methods employed have become necessary for the sake of economy, better work, or any number of other reasons.

In asphalt emulsion soil stabilization, we may have even more than our share of factors influencing the successful completion of a job, since stabilization by any known method involves many types and classes of soil aggregate. By the very nature of soil stabilization, we are often dealing with aggregate material containing a large percentage of fine aggregate and colloidal material.

This class of roadbuilding is frequently considered for the sake of economy, since it utilizes aggregate either on or near the road project. In order to obtain the best result from an emulsion, the engineer may have to improvise, altering the rates of application, the total application rate, the mixing methods, or perhaps the emulsion itself.

This may sound like a task that might better be bypassed, but after working with and studying local aggregate conditions in a particular area, the engineer may find little reason to change the specifications or the methods of construction. The engineer should not, however, lose sight of the fact that there may be some means by which he can improve on, or economize in, the requirements he has set as a standard.

Work with bound or sandy gravel

On roads that have been in use for a considerable period of time, either as traffic-bound gravel or sandy gravel surfaces, various types of slow-breaking or so-called mixing-grade emulsions may be used. The type of emulsion our own organization considers most adaptable as a binding medium is designated AE-200 in some states, AES-2 in others. The specifications for coating requirements are quite rigid and the demulsibility test calls for fairly high percentage limits.

This grade of emulsion has extremely high weather-resistant qualities. It has the ability to coat and mix with wet or dry aggregate in any range of gradation considered suitable for emulsion stabilization. And it may be mixed over an extended period of time.

In-place mixing

In New York State, there is a considerable amount of emulsified asphalt used in various ways. Generally, emulsified asphalt soil stabilization in New York might be considered as the mixing of the proper grade of emulsion with any aggregate containing fine-grained soils. In the fine aggregate sizes, the gradation limit of ma-

WITH CAT-BUILT EQUIPMENT

S. V. Rossi Construction Co., of Torrington, Conn., has found it pays to keep accurate records of machine costs. Here's a report by Mr. Adolph Rossi:

"When we buy a machine we figure the maintenance cost over a season. We've found there's no comparison—Caterpillar-built equipment has it over all other makes. We started in 1930 with machines built by two other manufacturers. Later we started trading them for Cat-built equipment because we had seen the light. Now we have all Caterpillar Diesel Tractors."

One of the machines in the Rossi fleet is the CAT* D7 Tractor with No. 7S Bulldozer, shown here grading a slope on a road construction job between Bethel and Woodstock, Vermont.

The D7 is a long-time favorite with contractors—a rugged, dependable producer. Today the *new* D7 (Series C) gives you the added advantage of a 128 HP engine and 28,700 pounds maximum drawbar pull. It has the long-wearing Caterpillar oil clutch; a gear driven balancer that gives smoother performance; a new starting engine with more power, and simple, single-lever control for easier operation. Track shoes are hardened by the "water-quench" process for longer life than ever.

Get the full facts about the new line of big yellow tractors from your Caterpillar Dealer. He'll give you a demonstration right on your job, and prove the claim of lower maintenance cost with facts. He offers reliable 24-hour service as well as a full stock of Caterpillar parts—parts you can trust. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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terial passing the No. 200 sieve would be considered as not greater than 10 per cent.

This method of mixing aggregate and emulsified asphalt with a Pulvi-Mixer has its advantages under certain conditions. It is fast. It can do a satisfactory job of mixing with certain gradations of aggregate. It is adaptable to the mixing of both dry and fine aggregate. If traffic has to be maintained, this operation creates less inconvenience to the traveling public.

This type of mixer is also capable of loosening up and shredding the traffic-bound roadway surface on which—or with which—the contemplated construction is to take place. Substituted for a scarifier on this type of road aggregate, it performs equally well in a shorter period of time and has less tendency to displace the aggregate.

When a road surface has been well maintained and has the desired crown and grade prior to the mixing operation, this unit, if properly operated, leaves a satisfactory grade and road surface by most standards. The use of a blade grader together with the mixer will provide an even better riding surface.

Cold mixing

Cold mixing of emulsions is advocated in many areas, and it may be considered as an economical and practicable method of construction. Best results are obtained when the work is projected into the warmer months of the year so that the curing period is shorter. The subbase should be a well-compacted course of pervious sand or gravel. Typical construction of emulsion stabilization in most areas calls for a depth of between 2 and 4 inches. In those areas of the country where frost penetration and sharp climatic changes occur, material going to greater depths should be constructed in lifts and an ample curing period be provided for each lift.

It may be worth while to consider a plant-mix emulsion using heated aggregate on stabilized construction for the larger projects, especially where the design calls for material being laid to depths of more than 4 inches.

In the actual construction of an emulsion-stabilized surface by road-mix methods, the rate of application in the mixing process should be between 0.5 and 0.75 gallon for each compacted inch of depth one square yard in area. Most work with Pulvi-Mixers is designed for a depth of 3 to 4 inches, although 3 inches of compacted depth is the rule in New York State for most road construction of this type. The exception is the stabilized course that is designed for a primary road. This 3-inch depth makes a total rate of application of between 1.5 and 2.25 gallon per square yard. This volume will give a bitumen content of between 2.5 and 4.9 per cent. The total quantity of emulsion applied is divided into two, and sometimes three, applications that are generally of equal rate.

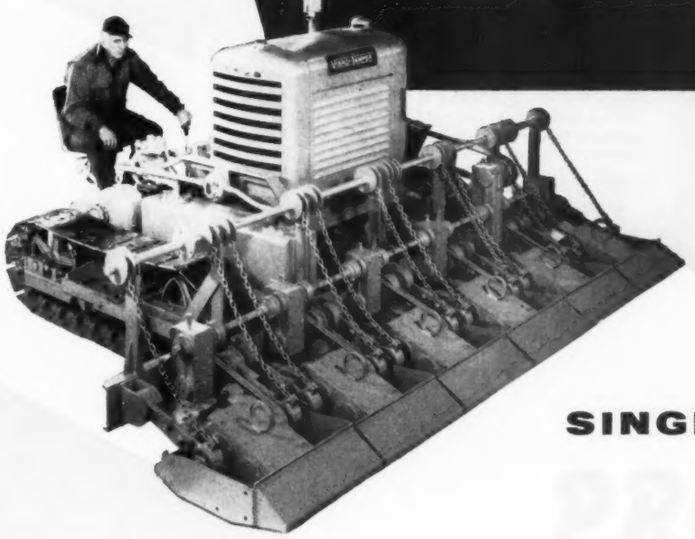
Before starting a project with a new source of aggregate, the engineer may find it to his advantage to compound numerous test samples composed of varying quantities of emulsion, to determine the percentage that will give the best stability, as well as other desired qualities. Each mixture in this case should be cured and compacted by standard laboratory procedures. This study will insure a clearer concept of what quantity of emulsion to order and, in some cases, what grade to specify.

Emulsion mixtures with stabilized soils will not have the black lustre that an equal volume of cutback asphalt will impart. It is important that this be thoroughly understood by the engineer. It can almost be established as a precept that when an emulsion mix has a glossy appearance, its bitumen content is too high. For this reason, it will not cure properly, nor will it give the desired stability in the completed road.

Compaction

Rolling of the unfinished stabilized surface should be performed by a flat-wheel roller, preferably working with a rubber-tire roller. All asphalt

FOLLOW THE SPREADER WITH
VIBRO-TAMPER



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emulsion stabilization work should be capped by a weatherproof wearing surface of either a single or double surface treatment or, in some cases, by a hot emulsion or hot asphalt paving mix.

In New York state we generally apply 0.4 to 0.5 gallon of RS-2 per square yard, with a cover aggregate composed of ⅝-inch crushed stone or slag chips. The seal coat may be applied in a few days with most emulsions, but it is a good practice to examine the mixture after a period of time to determine whether or not it has cured properly and is ready to receive a surface coat.

It is becoming more and more an accepted fact that there is less danger from loss of stability by improper curing of stabilized roads with the use of emulsions rather than cutback asphalts. When hot paving mixtures are laid as wearing surfaces on cutback or tar-stabilized courses, there is the possibility of having the heat draw some of the solvents into the paving mix. This cause of unstable conditions on innumerable roads is not present when emulsions are used.

THE END

From a paper "Asphalt Emulsion Stabilization—New York State", presented at the American Road Builders' Association meeting in Miami Beach, Fla.

Cummins plans expansion

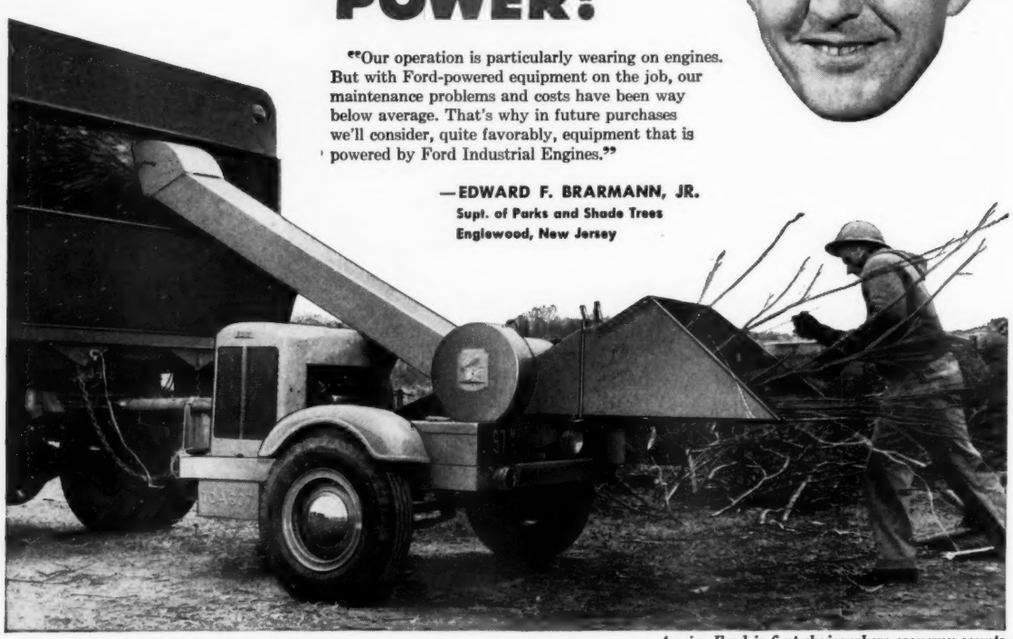
A $6 million capital program for 1956 has been put into effect by the Cummins Engine Co., Inc., Columbus, Ind. It includes a 73,000-square-foot addition to the firm's manufacturing plant.

ONE OF THE ELEVEN TIMBER ARCHES being used in the construction of a 200-foot-long hangar at Snohomish County Airport near Everett, Wash., is lifted into place by a pair of P&H truck-cranes. Timber Structures, Inc., laminated and erected the 210-foot-span arches.

"Maintenance alone has sold us on FORD POWER!"

"Our operation is particularly wearing on engines. But with Ford-powered equipment on the job, our maintenance problems and costs have been way below average. That's why in future purchases we'll consider, quite favorably, equipment that is powered by Ford Industrial Engines."

—EDWARD F. BRARMANN, JR.
Supt. of Parks and Shade Trees
Englewood, New Jersey



Again, Ford is first choice where economy counts

Englewood's Park Department now owns a total of six Ford-powered field units. Above, you see one of them in action—a 12″ Asplundh Brush Chipper.

Powered by a Ford "172" Heavy Duty Industrial Engine, this speedy worker takes on branches up to a half-foot in diameter. It eliminates double handling, does away with countless trips to dumping areas and steps up Englewood's brush removal program by an estimated *six times*.

You'll see Ford-powered equipment making short work of similar tasks *everywhere*. And with good reason. For only Ford—in a *full line* of modern overhead-valve 4-, 6- and 8-cylinder gasoline engines —offers the economy of Short Stroke design, the longer engine life of deep-block construction.

Ford Short Stroke design cuts friction, lessens engine wear and releases more *usable* power . . . power that goes to waste in ordinary engines. The benefits of deep-block construction (also available in Ford's new super-efficient 4-cylinder Diesel) are a smoother running, more durable engine—one that requires minimum maintenance even in the toughest going.

Little wonder efficiency-minded power users like Mr. Brarmann are swinging to dependable, low-cost Ford Power. Why not you?

And, to better serve industrial power users, a network of newly-appointed Ford Industrial Products Dealers has been set up across the nation. Now there's a Ford Industrial Power Headquarters in *your* area.

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AND POWER UNITS

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INDUSTRIAL ENGINE DEPT. FORD Division of FORD MOTOR COMPANY P. O. BOX 598, DEARBORN, MICH.
For more facts, use Reader-Reply Card opposite page 18 and circle No. 211

New text discusses tests on concrete

The American Society for Testing Materials has released a resume of current data about concrete in its special technical publication No. 169. Entitled "Significance of Tests and Properties of Concrete and Concrete Aggregates", the book contains a series of papers covering four principal subject-matter ranges.

Tables, charts, dimensions, and photographs illustrate each paper. Material contained in previous editions has been carefully revised, expanded, and brought up to date.

Available from the American Society for Testing Materials, 1916 Race St., Philadelphia, Pa., the 393-page book is priced at $6 for the cloth-cover edition and at $5.25 for the paper-cover volume.

CAA reports on concrete

The United States Department of Commerce, Washington 25, D. C., has released the findings of the Civil Aeronautics Administration in its study of concrete pavement. A number of base-course materials used in concrete-pavement construction have been evaluated by load-transmission tests.

CAA Technical Development Report No. 269, "The Load-Tranmission Test for Flexible Paving and Base Courses", Part IV, a complete report of the research, is available through the Department of Commerce. Priced at 50 cents, the illustrated booklet was prepared by Raymond C. Herner of the CAA Technical Development and Evaluation Center.

Kewanee Boiler Division appoints new president

Elbert M. Palmer has been appointed president of the Kewanee Boiler Division of American Radiator & Standard Sanitary Corp., Kewanee, Ill. The former executive vice president of the firm, he has been with Kewanee since 1926.

Mr. Palmer succeeds William Bradford Russell as president. Although retiring from active service, Mr. Russell will continue in a consultive capacity.

New rotary compressor can be turned in 13 feet

■ Joy Mfg. Co. has announced a new 600-foot rotary portable compressor, the Joy Airvane, for the construction and quarrying industries.

The manufacturer states that the thermal by-pass feature, heart of the Airvane temperature-control system, results in uninterrupted performance and economy. A controlled-velocity filter-separator unit with primary and secondary action efficiently removes oil from the compressed air.

The compressor's exterior housing, of high-strength steel, is weatherproof. Low center of gravity and short turning radius (13 feet) give excellent maneuverability.

For further information write to Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa., or use the Request Card that is bound in at page 18. Circle No. 171.

Joy's new Airvane compressor is weatherproof, features low center of gravity.

Le Roi Division appoints

Charles S. Hempelman has been named market analyst for the Le Roi Division of Westinghouse Air Brake Co., Milwaukee, Wis., manufacturer of portable and stationary compressors.

Mr. Hempelman will be responsible for the evaluation of Le Roi's present markets and the research and analysis of new markets for already existing products and for products under development.

ICEI elects officers

The executive vice president of the Cummins Engine Co., Inc., Columbus, Ind., E. D. Tull, has been elected president of the Internal Combustion Engine Institute, succeeding B. G. Van Zee. Mr. Van Zee, the chief engineer of Minneapolis-Moline Co., Minneapolis, Minn., will continue as a member of the board of directors.

The new vice president is F. C. Langston of the Harnischfeger Corp., Milwaukee, Wis. C. E. Nelson, Jr., of the Waukesha Motor Co., Waukesha, Wis., will serve as treasurer, and Phil Norton, executive vice president of the Wisconsin Motor Corp., Milwaukee, will serve as the secretary of the organization.

Du Pont issues check list for summer maintenance

E. I. Du Pont De Nemours & Co., Wilmington, Del., manufacturer of Zerone and Zerex antifreezes, has made a study of efficient hot-weather operation of shovels, trucks, tractors, cranes, and other construction units, and has settled on four basic maintenance procedures.

Du Pont recommends: (1) drain antifreeze solutions from radiators and engine blocks; (2) clean and flush cooling system, using a chemical cleaner if necessary; (3) check all parts of the cooling system for leaks or signs of wear, repairing and replacing where necessary; and (4) refill radiators with fresh water and add a rust inhibitor.

Thor forms new division

A construction equipment division has been formed by the Thor Power Tool Co., Aurora, Ill., in order to develop equipment for the construction industry to supplement the company's present line of air and electric tools.

William J. Miller and Elmer R. Stitt, former president and vice president of the Master Vibrator Co., Dayton, Ohio, will head the new division. Product design and development will be handled by W. C. Nussbaum and Paul Devoe.

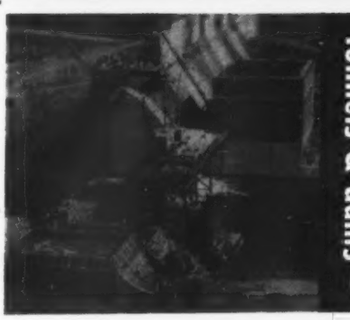
For more facts, circle No. 212

RICHMOND REFERENCE GUIDE FOR YOUR CONCRETE CONSTRUCTION NEEDS

CUT OUT AND FILE

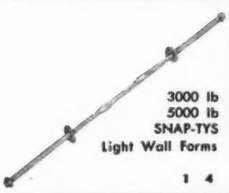
buildings ①

roads & bridges ②

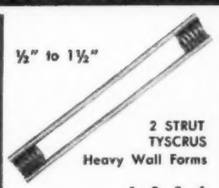


tunnels & dams ③

water & sewage PLANTS ④

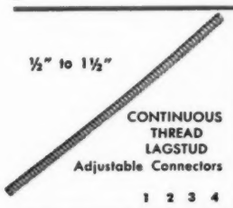


3000 lb
5000 lb
SNAP-TYS
Light Wall Forms
1 4



½" to 1½"
2 STRUT
TYSCRUS
Heavy Wall Forms
1 2 3 4

1" to 1½"
4 STRUT
TYSCRUS
Mass Concrete Forms
2 3



½" to 1½"
CONTINUOUS
THREAD
LAGSTUD
Adjustable Connectors
1 2 3 4

½" to 1½"
TYLOOPS
Form Anchorage
3

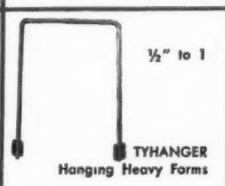
⅜" to 1½"
SCREW ANCHORS
AND BOLTS
Anchorage to Concrete
2 3

1¼" - 1½"
WHIRL-WIND
ANCHORS
(No Slip)
Lift Form Anchorage
3

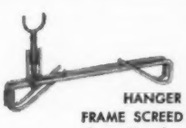
¼" to ¾"
THREADED INSERTS
Fastening to Concrete
1 2 3 4

⅝" - ¾"
PEERLESS WEDGE INSERT
Shelf Angle Support
1

SNAP-TY
HANGER
Hanging Light Forms
1 4



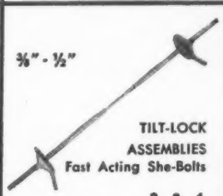
½" to 1
TYHANGER
Hanging Heavy Forms
1 2 4



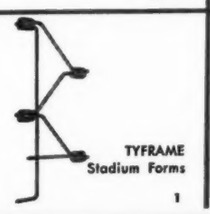
HANGER
FRAME SCREED
Form Hanging
and Screeding
2

ADJUSTABLE
SCREED CHAIR
Screeding Slabs
1 2 4

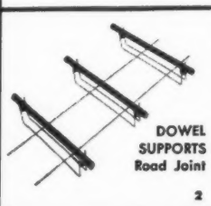
REINFORCING
BAR SUPPORTS
Steel Support
1 2 3 4



⅜" - ½"
TILT-LOCK
ASSEMBLIES
Fast Acting She-Bolts
2 3 4



TYFRAME
Stadium Forms
1



DOWEL
SUPPORTS
Road Joint
2

LOAD
TRANSFER
ASSEMBLIES
Airport Slabs
2

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RICHMOND REFERENCE GUIDE FOR YOUR CONCRETE CONSTRUCTION NEEDS

John A. Volpe, Massachusetts commissioner of public works, and new AHONAS president John O. Morton prepare to board one of half a dozen busses which took the North Atlantic highway officials on a tour of highway projects in and around metropolitan Boston.

North Atlantic highway offici

"The only way you are going to get the men you need (for engineering work) in the next 20 years is to recognize the semiprofessional level and utilize the talents of its trained technicians."

So a New England educator advised North Atlantic states highway officials considering the current engineer shortage at their annual convention last month in Boston.

The speaker was H. Russell Beatty, president of Wentworth Institute, Boston, and one of the participants in a panel discussion, Personnel Training and Recruitment, which highlighted the three-day conclave.

More than 900 officials of the highway departments of 11 North Atlantic states and the District of Columbia attended the annual meeting.

Dr. Beatty suggested a new and somewhat revolutionary solution to the engineer shortage problem. Declaring that "the professional level is fast being depleted," he told the highway officials that their only recourse is "the next level of ability".

Many men who finish a technical-school course can be valuable to highway departments and contractors, even though they are not professional engineers, the educator pointed out. It remains only for them to be given the recognition—both in salary and in professional standing—commensurate with the responsibilities they would be expected to assume.

The educator went further by declaring that his school would inaugurate a two-year course in construction engineering for these "semi-professional technicians" if highway departments indicated they could use graduates of such a course.

New officers

The personnel panel was a feature of the convention's final-day session. It preceded a concluding business session during which John O. Morton, commissioner of the New Hampshire State Highway Department, was elected AHONAS president for the ensuing year.

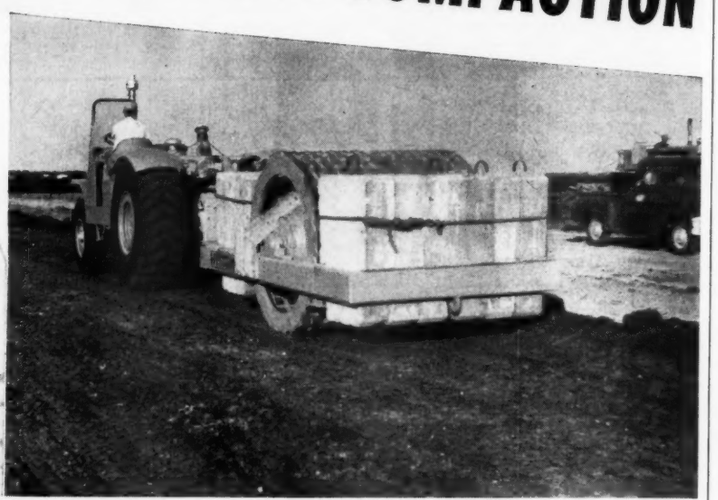
Others elected were Earl J. Mattis, superintendent of highways for St. Lawrence County in New York State, vice president, and Kenneth D. Rice, secretary of the New Jersey State Highway Department, secretary and treasurer.

Retiring president Russell H. McCain, chairman of the Maryland State Roads Commission, presided at the convention sessions.

Other business of the concluding session included adoption of a resolution urging Congress "to enact an adequate and enlarged program for highways in order that highway officials may be able to plot a course ahead and start with the planning, design, and construction of the needed system of highways without further delay".

The resolution asked further that such legislation "provide for the same partnership and method of adminis-

Now this is HIGH SPEED COMPACTION



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As a rock crusher, the "Grid" Roller speeds secondary road building by crushing pit-run material right on the sub-grade for surface or base courses.

As a bituminous salvaging tool, the "Grid" Roller (1) disintegrates and reclaims old mat material (2) compacts the base (3) rolls the new surface . . . thus saving up to 50% in time and material. Be sure to see the Hyster Job Reports on "Grid" Roller applications.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 213

...udy engineer shortage

Russell H. McCain (second from left), retiring AHONAS president, congratulates John O. Morton, the incoming president. Other new officers of the organization are Kennth D. Rice (left), secretary and treasurer, and Earl J. Mattis, vice president.

tering and constructing the program cooperatively between the Bureau of Public Roads and the several state highway departments that . . . has worked so efficiently and satisfactorily through the years."

Copies of the resolution were to be sent to the president of the United States, members of Congress, governors of the states, and the secretary of commerce.

Other speakers on the personnel panel included Harold Shannon, project manager for Morrison Knudsen Co. on the Newington, N. H., Air Force Base, who told the highway officials that of 22 engineers on the construction firm's payroll for that job, only three had engineering degrees.

The project manager stated that contractors often find that applicants for field engineer jobs "are reluctant to work out in the field as subordinates." In M-K's experience, he said, "it's a case of everybody wanting to be chiefs and nobody wanting to be just an Indian."

Contractors are at a disadvantage in employing engineers, Mr. Shannon pointed out, because the work is seasonal, because young engineers must be given a particular job to do rather than being given the broader training they desire, and because "we can't pay them too much."

"The big problem, however, is their reluctance to get out in the field and work," he maintained. "They see the trades getting better money, time-and-a-half wages for overtime, and other benefits—and this naturally has a bad effect on their morale."

Joseph A. Combs, director of personnel for the New Jersey State Highway Department, discussed the importance of interview techniques, canvassing of college campuses, and recruiting and training programs. Donald C. Wetmore, specialist in personnel development for the aircraft accessory turbine department of the General Electric Co., told the highway officials that industry's chief difficulty with regard to engineers was in recruiting both the quality and quantity of men needed.

Prof. John B. Wilbur, head of the Department of Civil and Sanitary Engineering at the Massachusetts Institute of Technology, moderated the discussion. In summarizing the speakers' remarks, he said that both civil engineering groups and employer bodies should send representatives to college campuses to enlist the services of graduate engineers, and that these same bodies should help schools financially and otherwise to encourage young men who show an interest in

(*Continued on next page*)

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Ingersoll-Rand
Air Tool Division
11 Broadway, New York 4, N.Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 214

(Continued from preceding page)

engineering as a career.

The contractor's viewpoint

Another panel discussion which proved a popular feature of the convention program was devoted to The Contractor's Side of the Highway program. B. D. Tallamy, chairman of the New York Thruway Authority, moderated the discussion, and speakers were representatives of contracting firms and highway departments.

Philip V. Corey, president of W. H. Hinman, Inc., North Anson, Me., said contractors' foremen must be educated by resident engineers in the exact specifications and methods called for in a highway construction job.

Hugh Connelly of the New Jersey State Highway Department told the assembled officials that "in New Jersey, the unions are running the jobs, not the contractors."

If an engineer delays operations on a job, he is costing the contractor money over which he has little control, the speaker declared. "Today," he said, "the contractor only keeps the books and signs the checks." The official said it is important that engineers familiarize themselves with these and other problems of the contractor.

Others on the panel were LeRoy W. Kern, of Harry T. Campbell Sons Co., Inc., Towson, Md., and Burl A. Wilder, of the Savin Construction Corp., East Hartford, Conn. All discussed points of highway construction on which contractors and highway engineers could cooperate more closely to better advantage.

Highway program

Three main convention speakers reviewed the urgent need for highway improvement legislation and discussed aspects of the highway picture in this country.

C. D. Curtiss, commissioner of the Bureau of Public Roads, discussed highway improvements in the Boston metropolitan area and the economic benefits resulting from these improvements.

B. L. Ray, vice president in charge of marketing for the Esso Standard Oil Co., suggested that any highway-improvement program undertaken should provide for construction of highways to meet the needs of 1965 or 1975. He told the delegates that a predicted 81,000,000 cars or other vehicles will be using the nation's highways in 10 years, and that this factor, plus the potential economic expansion due to increased use of travel arteries, demands building for the future and not just the present.

John A. Volpe, commissioner of the Massachusetts Department of Public Works, likened the nation's interstate highway system to a pattern of scatter rugs only partially covering a floor.

"The room looks well in spots," the commissioner pointed out, "but coverage is spotty. Open spaces of polished floor are left, and they are dangerous if we don't watch our step."

Individual action

The time has come for individuals to use their voter's voice in urging passage of adequate highway legislation, Rex M. Whitton, president of the American Association of State Highway Officials, told the New England highway officials in an earlier convention address. The national association officer said congressmen still need to be convinced of the need for this huge appropriation, and that the constituent's letter is still the best means of convincing the solon.

"The Associated General Contractors has assured me that it stands ready to do the enormous volume of work entailed in such a highway program, and material suppliers and manufacturers need only the go-ahead signal," Mr. Whitton declared.

"Now the job is up to us—to contact our congressmen and let them know that we, as voters, feel this program is imperative."

Tour of projects

As guests of the Massachusetts Department of Public Works, the delegates were given a bus tour of highway construction and improvement projects either completed or under contract in the Boston metropolitan area. The elevated roadway of the Fitzgerald Expressway, other recent roadbuilding projects, and some experimental resurfacing projects were viewed.

Corps of Engineers work in cleaning up after the New England floods

(Concluded on next page)

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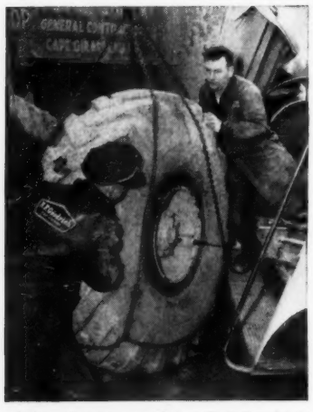

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CONNECTICUT

HARTFORD—B. F. Goodrich Store JAckson 7-2121

FLORIDA

JACKSONVILLE—B. F. Goodrich Store EL 4-2801
MIAMI—B. F. Goodrich Store FR 3-2113
OCALA—B. F. Goodrich Store MA 2-4254
TAMPA—B. F. Goodrich Store 2-8024
WEST PALM BEACH—B. F. Goodrich Store 2-4181

GEORGIA

ALBANY—B. F. Goodrich Store HEmlock 2-6481
ATLANTA—B. F. Goodrich Store WAlnut 5035
AUGUSTA—B. F. Goodrich Store 2-2574
GAINESVILLE—Gainesville Tire Company LEnox 2-2551
MACON—B. F. Goodrich Store 3-4456
SAVANNAH—B. F. Goodrich Store 6-0631

IDAHO

BOISE—Hill's Recapping Service 4-5557

ILLINOIS

CHICAGO—Chicago Tire & Rubber Co. Monroe 6-6400
CHICAGO—Consumers Tire & Supply Haymarket 1-7514
DECATUR—B. F. Goodrich Store 5256
MOUNT VERNON—Ranmar's Standard Tire Co. 66
OAK PARK—B. F. Goodrich Store Euclid 3-4000
PEORIA—B. F. Goodrich Store 4-4181
QUINCY—B. F. Goodrich Store Baldwin 2-4800
ROCKFORD—B. F. Goodrich Store 2-6619

INDIANA

HAMMOND—B. F. Goodrich Store Westmore 2-5100
SOUTH BEND—B. F. Goodrich Store Central 1144

IOWA

CEDAR RAPIDS—B. F. Goodrich Store 4-5165
DES MOINES—B. F. Goodrich Store 4-7278
FORT DODGE—Zakeer A & H Supply 4-3861
MARSHALLTOWN—B. F. Goodrich Store 5581
MUSCATINE—B. F. Goodrich Store 3-2524

KANSAS

WICHITA—B. F. Goodrich Store FOrest 3-1284

KENTUCKY

ASHLAND—B. F. Goodrich Store East 5-2242
BOWLING GREEN—B. F. Goodrich Store VI 3-4308
LOUISVILLE—B. F. Goodrich Store WA 4141
PADUCAH—B. F. Goodrich Store 5-5454

LOUISIANA

BATON ROUGE—B. F. Goodrich Store 2-6895
LAKE CHARLES—B. F. Goodrich Store 6-0847
NEW ORLEANS—B. F. Goodrich Store CAnal 0191

MARYLAND

BALTIMORE—B. F. Goodrich Store Belmont 5-9054
BALTIMORE—Baltimore Rubber Sales Saratoga 7-4200

MASSACHUSETTS

BOSTON—Merchants Distributors, Inc. Kenmore 6-4780
NORTH ADAMS—B. F. Goodrich Store Mohawk 4-0465
WORCESTER—B. F. Goodrich Store PLeasant 5-4397

MICHIGAN

DETROIT—B. F. Goodrich Store FO 6-4900
LANSING—B. F. Goodrich Store 2-0621

MINNESOTA

DULUTH—B. F. Goodrich Store RA 4-8505
MINNEAPOLIS—B. F. Goodrich Store BR 1195
ST. PAUL—B. F. Goodrich Store CA 2-3817

MISSISSIPPI

NATCHEZ—B. F. Goodrich Store 3-1651

MISSOURI

KANSAS CITY—B. F. Goodrich Store VAlentine 1-4777
POPLAR BLUFF—J. A. Parker Tire Company 3938
ROLLA—Fisher's Hawkinson Tread Tire Service 445
ST. LOUIS—B. F. Goodrich Store FO 7-9300

B.F.Goodrich FIRST IN RUBBER

CALL US FOR
B.F.Goodrich
TIRES AND ROAD SERVICE

NEBRASKA

LINCOLN—B. F. Goodrich Store	2-4497
OMAHA—B. F. Goodrich Store	JA 4024
OMAHA—B. F. Goodrich Store	MA 0460

NEW MEXICO

ALBUQUERQUE—B. F. Goodrich Store	3-5587

NEW YORK

ALBANY—B. F. Goodrich Store	4-8115
BUFFALO—B. F. Goodrich Store	GR 4040
DELHI—A & B Tire Service	394
MASSENA—B. F. Goodrich Store	Rockwell 9-3541
POUGHKEEPSIE—B. F. Goodrich Store	9275
SYRACUSE—B. F. Goodrich Store	74-5351

NORTH CAROLINA

CHARLOTTE—B. F. Goodrich Store	ED 3-4134
DURHAM—Nu-Tread Tire Co.	9-2087
GREENSBORO—Davis Tire Company	2-1182
RALEIGH—B. F. Goodrich Store	3-3831

NORTH DAKOTA

FARGO—B. F. Goodrich Store	2-7461

OHIO

AKRON—B. F. Goodrich Store	Hemlock 4-2101
CHILLICOTHE—B. F. Goodrich Store	2-9670
CINCINNATI—B. F. Goodrich Store	CH 1-4050
CLEVELAND—B. F. Goodrich Store	PRospect 1-2650
COLUMBUS—B. F. Goodrich Store	CApitol 1-6661
DAYTON—B. F. Goodrich Store	AD 9181
FINDLAY—B. F. Goodrich Store	72
MANSFIELD—B. F. Goodrich Store	4-5006
MARIETTA—B. F. Goodrich Store	2950
TOLEDO—B. F. Goodrich Store	Adams 1258
WOOSTER—Strocks	Howard 2-6906

OKLAHOMA

MIAMI—Miami Sales Company	Kimball 2-7888
OKLAHOMA CITY—B. F. Goodrich Store	Forrest 5-1347
TULSA—B. F. Goodrich Store	Luther 5-1221

OREGON

PORTLAND—B. F. Goodrich Store	Belmont 6-2106

PENNSYLVANIA

ALLENTOWN—B. F. Goodrich Store	Hemlock 3-3248
ERIE—B. F. Goodrich Store	23205
HARRISBURG—B. F. Goodrich Store	Cedar 4-6296
HOMETOWN—Schultz's	Tamaqua 2300
JOHNSTOWN—McNally Tire & Rubber Co.	5-4321
NORRISTOWN—Lincoln Battery & Tire Co.	Broadway 5-2940
PHILADELPHIA—B. F. Goodrich Store	Jefferson 3-9417
PITTSBURGH—B. F. Goodrich Store	MU 2-8310
TURTLE CREEK—B. F. Goodrich Store	EL 1-2077

SOUTH CAROLINA

CHARLESTON—B. F. Goodrich Store	2-8391
GREENVILLE—Tires, Inc.	5-9657

SOUTH DAKOTA

SIOUX FALLS—B. F. Goodrich Store	4-9979

TENNESSEE

CHATTANOOGA—B. F. Goodrich Store	7-1178
JOHNSON CITY—Youngs Supply Company	102
KNOXVILLE—Tinsley Tire Company	5-0286
MEMPHIS—B. F. Goodrich Store	JA 5-8477
NASHVILLE—B. F. Goodrich Store	Alpine 5-6353

TEXAS

AUSTIN—B. F. Goodrich Store	Greenwood 6-9155
CORPUS CHRISTI—B. F. Goodrich Store	Tulip 4-8841
DALLAS—B. F. Goodrich Store	RIverside 1201
EL PASO—B. F. Goodrich Store	3-2478
FORT WORTH—B. F. Goodrich Store	FA 9188
HOUSTON—B. F. Goodrich Store	CApitol 7-0141
SAN ANTONIO—B. F. Goodrich Store	CApitol 7-7278

UTAH

PROVO—B. F. Goodrich Store	Franklin 3-6715
SALT LAKE CITY—B. F. Goodrich Store	EM 4-7858

VERMONT

RUTLAND—Abel's Tire Corporation	Prospect 3-3700
ST. JOHNSBURY—Northern Auto Supply	Pioneer 8-2327

VIRGINIA

LYNCHBURG—Ratcliffe Carpenter Tire Co.	7-2735
NEWPORT NEWS—B. F. Goodrich Store	6-1329
PORTSMOUTH—B. F. Goodrich Store	EX 7-4673
RICHMOND—B. F. Goodrich Store	5-3286
ROANOKE—B. F. Goodrich Store	5-7766
ST. PAUL—Tri-County Tire Service	Rockwell 2-5301
WINCHESTER—B. F. Goodrich Store	2-0381

WASHINGTON

SEATTLE—B. F. Goodrich Store	Elliott 6666
SPOKANE—B. F. Goodrich Store	Main 5271

WEST VIRGINIA

BLUEFIELD—B. F. Goodrich Store	Davenport 5-7141
CHARLESTON—B. F. Goodrich Store	6-0431
CLARKSBURG—B. F. Goodrich Store	4-7681
HUNTINGTON—Stettler Tire Company	3-0197

WISCONSIN

LA CROSSE—B. F. Goodrich Store	4-4336

B.F.Goodrich
FIRST IN RUBBER

(*Continued from preceding page*)

was illustrated in a film shown to the delegates. Another film showed steps involved in widening of New Jersey's Garden State Parkway.

Atlantic City was announced as the site of next year's convention, to be held February 27—March 1. THE END

Pneumatic seat base saves wear on operator

■ The new Sky-Ride pneumatic seat base is designed to eliminate shocks, bumps, and jars which often hinder the operators of heavy vehicles or other equipment. The unit is designed

The new Sky-Ride pneumatic seat base eliminates jars in heavy equipment operation.

to provide greater productive hours by eliminating fatigue through easier riding over rough terrain or during prolonged periods of ordinary driving.

The new seat base is 90 per cent aluminum, offering lightest weight with greatest strength. Steel is confined to critical moving parts for longest possible unit life. The unit weighs about 28 pounds.

Operating on approximately 5 pounds of air, the base is adjusted by moving a "ride knob" to obtain any degree of cushioning. Either a "stiff" or a "soft" ride can be obtained with this adjustment. Glide adjusting shoes are mounted on the bottom of the base.

For further information write to Sky-Ride, 601 S. Rampart Blvd., Los Angeles 57, Calif., or use the Request Card that is bound in at page 18. Circle No. 59.

Transit mixers

■ A two-speed transmission is one of the features of a transit mixer manufactured by the Adams Division of LeTourneau-Westinghouse. A diagram of the hopper unit points out the 36-inch drum discharge opening, and the 32×34-inch charging opening. Another diagram of the entire drum mounting shows the fully-enclosed drum gear drive, the self-aligning ball-and-socket drum mounting, and the joint coupling between engine and transmission. Basic units, optional equipment, and specifications are detailed.

To obtain this bulletin write to Adams Division, LeTourneau-Westinghouse Co., 217 S. Belmont Ave., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 47.

"Must you always argue with somebody with nails in your mouth?"

One of the many Davis trucks equipped with RCA Radio and, inset, dispatcher talking to truck on location.

"We save thousands of dollars every year with RCA 2-Way Radio!"

President Al Davis, youthful head of the Davis Construction Corp., Hicksville, N. Y., has been sold on RCA 2-Way Radio since its installation. Says he, "Our radio system has proved absolutely invaluable in meeting schedules. We save thousands of dollars every year by eliminating unnecessary travel. We dispatch equipment directly from job to job, reschedule it in emergencies, call it in—without the expense of idle time. On the basis of our hourly costs RCA 2-Way Radio paid for itself in less than a year by saving at least an hour a day." By saving manhours and equipment time, this progressive company has been able to step up its profits. The efficiency of the entire company has increased since they got radio. Why don't you use RCA 2-Way Radio?

Why are the leaders choosing RCA?

They are impressed with RCA's fine service organization and the years of RCA leadership in radio and electronics. Superior tubes, crystals and microphone for clearer talking, longer life . . . heavy-gauge steel case for rugged use.

RCA DISPATCHER 2-WAY RADIO TO DRIVER

Get the whole story—Mail Coupon

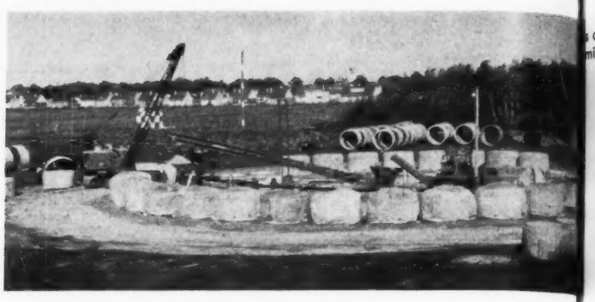
RADIO CORPORATION of AMERICA
Communications Products
Dept. D-277, Building 15-1, Camden, N. J.
In Canada: RCA VICTOR Company Limited, Montreal

☐ Please send me complete information on use of RCA 2-Way Radio in construction.
☐ Have RCA Communications Specialist make a FREE RADIO SURVEY of my business.

Name ..... Title .....
Company .....
Address .....
City ..... Zone ..... State .....

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 216

Concrete plant turns out sections for sewer line in matter of minutes



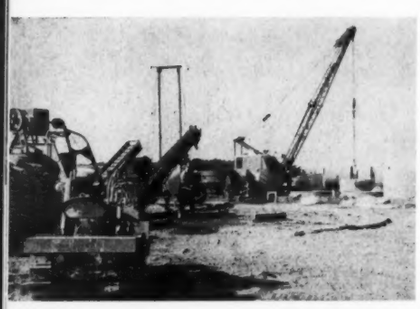
Portable setup completes 30 sections of 90-inch pipe every day for 9,000-foot sewer line in suburban area

The Vibrapipe process for manufacturing concrete pipe made it possible for 9,000 feet of 72 to 90-inch pipe to be made and put down quickly to complete a badly needed sewer line for St. James, a village in the province of Manitoba, Canada.

The line runs through the outskirts of Winnepeg's International Airport, an area long subject to flash floods in spring and fall and which is currently being used for suburban development. This development made it imperative for a sewer line to be installed quickly and without excess cost.

Process uses harsh concrete

Using the Vibrapipe process developed by the George W. Hoffman Co., Sioux City, Iowa, and associated companies, the firm of Manitoba Supercrete, Ltd., St. Boniface, Manitoba, produced 30 lengths of 90-inch pipe daily for the project. Pipe sections were poured on a series of 32 concrete slabs, each of which had a base ring pallet for the pipe, at a circular shaped manufacturing yard about 100 feet in diameter.



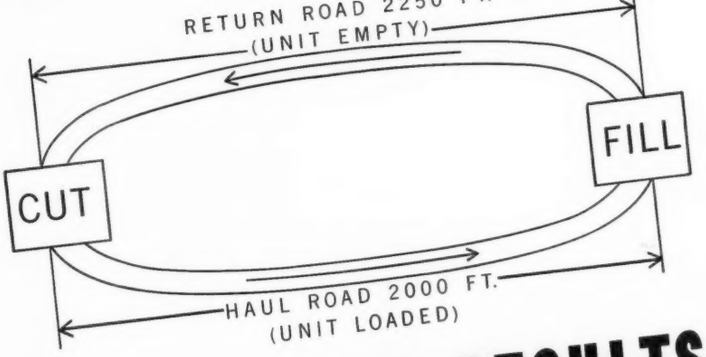
The yard of concrete supplied every two minutes by the concrete mixer at left goes first to the storage hopper then to the 60-foot conveyor leading to the forms. The crane, with 20-foot boom, handles completed sections and pipe forms.

A concrete mixer delivered a yard of concrete to a pipe form in two minutes or less, with the help of a 60-foot concrete conveyor that brought concrete through an adjustable loader to the pipe form. Four Vibrapipe vibrators, fastened to the pipe form, compacted concrete going into the mold. The use of a dry, harsh concrete made it possible to strip the form immediately after the material had been consolidated, making the form available for the next section.

Sections completed fast

Forms were poured in about five or

CONTRACTOR COMPARES "EQUALLY RATED" SCRAPERS ON JOB IN NEW JERSEY

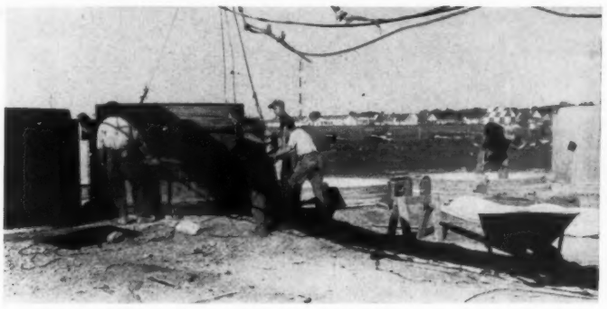


HERE ARE THE RESULTS

	CAT* DW21-NO. 470 LOWBOWL SCRAPER	SCRAPER-U A
Average load in bank cu. yd. . . .	18.0	16.5
Total average cycle time on 4250-foot round trip	4.77 min.	5.28 mi
Trips per hour	12.6	11.3
Production, bank cu. yd./hour . . .	227	187

LOWBOWL ADVANTAGE: 40 BANK CU. YD. AN HOUR

over-all view of the 100-foot-diameter site shows the location of the con-
mixer, the 60-foot concrete conveyor, and the yard crane.



A 90-inch Vibrapipe form, stripped from the freshly poured section, at left, is set around an adjacent base-ring pallet. Sections will next be poured on the two other pallets in the line.

six minutes and, once the form had been stripped, the finishing of the tongue end of the new pipe was done in about another five minutes.

The form core was then stripped by a crane equipped with a 20-foot boom, and placed on the adjoining base ring pallet. The tongue-forming header was removed next, then the two halves of the outside form shell. The outside form shell was then reassembled around the core on the pallet, while two lines of steel wire mesh were placed around the core. When the outside form had been securely locked, and the core-cover hopper put back in place, the concrete loader was swung over the reassembled setup to deliver concrete to the new form.

The newly completed section was covered with a plastic bag to protect the cement-water-slime coating from

Workmen prepare to remove the tongue-forming header from a form to which the Vibrapipe vibrators are attached. The section at right has been covered by a plastic bag to keep the concrete moist.

wind and sun. After two hours, steam generated by a portable boiler at the end of the concrete plant was introduced inside the covering to keep the concrete moist.

Process is continuous

Work was carried on almost continuously. As soon as pouring ended, forms were stripped and reassembled on an adjacent base-ring pallet, and the concrete loader was turned to bring concrete to the new form.

Twelve hours after a pipe section had been poured, it was picked up by the crane and placed on its side in a storage yard for a few days of air curing before being transferred to the newly exacavated trench.

Of the 9,000 feet of pipe made for the line, 2,000 feet was of 90-inch diameter, 2,000 feet of 84-inch diameter, and 5,000 feet of 72-inch diameter. The design of the plant layout, and supervision of the plant's operation was done by George Poitras, plant superintendent of Supercrete, Ltd. THE END

Dixie Cup appoints two new vice presidents

Edgar Winne and Craig Moore have been elected vice presidents of the Dixie Cup Co., Easton, Pa. With the firm since 1923, Mr. Winne has served in many executive capacities with the firm.

Mr. Moore has served as sales director of the commercial products division and is also a director of the company.

←For more facts, circle No. 217

CAT LOWBOWL SCRAPER
OUTLOADS COMPETITION AGAIN!

t October, when another wheel unit was needed for omas M. Durkin and Sons Co.'s job near Mantua, w Jersey, a new Cat DW21-No. 470 Lowbowl Scraper matched against a new "equally rated" scraper-t. In this test, as in other on-the-job tests under ual working conditions, the Caterpillar unit definitely produced competition. As a result, the company chased the DW21-No. 470—as well as a D9 pusher.

Here's *proof* again that Caterpillar's exclusive Lowbowl Scraper design pays off in bigger, faster loads. For completely documented test facts, including names and dates, see your Caterpillar Dealer. Judge for yourself how the DW21-No. 470 Lowbowl Scraper can step up your production and profits!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Details of on-the-job comparison!

B DESCRIPTION: Thomas M. Durkin and Sons Co. a project near Mantua, New Jersey, preparing building s, constructing streets, etc., for a 1000-home develop-t. The company needed another wheel unit for its ead to make possible full pusher efficiency. To get a ct comparison of production, a new Cat DW21-No. 470 wbowl Scraper and an "equally rated" new 2-wheel aper-unit were pitted against each other on the job under ntical conditions. Here's some basic data on the units:

	DW21-No. 470	Scraper-unit A
ed capacity, struck	18 cu. yd.	18 cu. yd.
heaped	25 cu. yd.	24 cu. yd.
e weight	57,320 lb.	68,400 lb.
gine horsepower rating	300	300
aper operation	Cable	Hydraulic

Caterpillar D9 torque-converter Tractor and "Tractor A" re demonstrated as pushers, the D9 push-loading the W21-No. 470 and "Tractor A" push-loading Scraper-unit A.

NDITIONS: *Material*—sand with some clay; density 2700 cu. yd., very low swell. *Loading*—level cut, sand loose not completely "dead." *Average haul distance*—2000 t. *Average return distance*—2250 feet. *Haul grades*—200 feet, 4% average upgrade; 500 feet, negligible grade; 1300 feet, 3% average downgrade. *Travel road*—fair; packed sand.

TIME STUDY DATA:

	DW21-No. 470	Scraper-unit A
Average loading time, min.	.59	.63
Average haul, dump, return time, min.	3.88	4.35
Total no-delay cycle time	4.47	4.98
Waits and delays, averaged between units to facilitate comparison	.30	.30
Total cycle time, min.	4.77	5.28
Average load, bank cu. yd.	18	16.5
Trips per hour	12.6	11.3
Production, bank cu. yd./hour	**227**	**187**

REMARKS: The excellent loading characteristics of the Lowbowl Scraper, plus its fast pumping cable operation, gave the No. 470 a clean-cut advantage over hydraulically operated Scraper-unit A. The DW21, with its efficient power train, made more than one extra trip an hour on the 4250-foot haul and return. Though grades were light, they slowed down Scraper-unit A, while the DW21-No. 470 took them in stride. Result: the DW21-No. 470 handled an average of 1.5 more bank cu. yd. a trip than Scraper-unit A—or the equivalent of 400 more a 10-hour day!

e new two-wheel Cat DW21-No. 470 Lowbowl Scraper

new four-wheel DW20-No. 456 Lowbowl Scraper is o available. Both units feature the new Turbocharged cylinder Caterpillar Engine which delivers 300 HP 1800 RPM and 10% more rimpull. New Lowbowl sign loads more material with less resistance clear to e end of the loading cycle. All these and other new atures add up to bigger, faster loads for you with at Lowbowl Scrapers.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BIGGER, FASTER LOADS WITH CAT LOWBOWL SCRAPERS

distributor doings

New equipment franchise sparks huge expansion program in Ohio

Its acquisition late last fall of the International Harvester industrial power-equipment franchise for the state of Ohio set off an expansion program in the Rish Equipment Co. which will virtually double the size of the distributorship when it is completed. The main plant of the firm, which is now covering all of Ohio and the two Virginias, is at Bluefield, W. Va.

Latest developments in the expansion program are the occupancy this month of a new permanent plant at 9255 Brookpark Road in Cleveland, Ohio, and the beginning of construction of a similar plant at 3131 Beulah Road in the Ohio capital, Columbus. Property has also been purchased for another Ohio setup at Youngstown.

Along with the I-H franchise, Rish also acquired the Harnischfeger, Hough, Drott, CMC, and Rosco lines for Ohio. Other manufacturers handled by the firm include Barber-Green, Blaw-Knox, Bros, Carco, Gorman-Rupp Hughes-Keenan, Ingersoll-Rand, Master Vibrators, Salem McCarthy, Smith, and Warner & Swasey.

When it opens for business, the Youngstown plant will be the fourteenth in the Rish organization and the last of six new branches that will have been put into operation. Since obtaining the I-H franchise, plants have been opened in Parkersburg, W. Va., and Toledo, Ohio, and a central repair and rebuilding shop has been established in Princeton, W. Va.

Other Rish branches are located in Cincinnati, Dayton, and Portsmouth, Ohio; Charleston and Clarksburg, W. Va.; and Richmond and Roanoke, Va.

The opening of the new branches, four of them in metropolitan centers, has enabled Rish to make deserved promotions from within its own ranks. Rish personnel, themselves, aided in the recruiting of sales staffs to handle the new areas.

The sales training school that the firm established soon after the end of World War II has been operating at an accelerated pace to bring the strength of the sales forces at the new branches up to par. Scores of parts, service, and office personnel have also been trained and assigned to the new plants.

Supervision and coordination among the many offices of the company has become "airborne" with the purchase of an executive twin-engined Piper Apache airplane, appropriately named Skydozer III. THE END

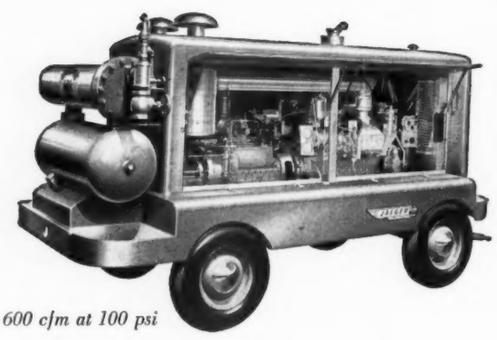
TO MINIMIZE TRAFFIC INTERFERENCE on a busy street, two cuts at a time are being made on this job of replacing gas main clamps. Cuts are 30″ sq. and 26″ average depth and are being backfilled immediately. The Jaeger Air-Plus Roto® 125 compressor has the capacity to run both heavy breakers at top efficiency.

BACKFILLING 7 MILES OF TRENCH after laying a utility line, this Jaeger "125" Roto is being used to operate a triplex tamper. The users report: "We liked our first Jaeger Rotary so well we bought two more".

Jaeger 125 Rotary speeds your street work

With a Jaeger 125 "Roto" you have *constant* 100 lbs. pressure under all air demands up to 125 cfm—enough to run two 80 lb. breakers at top efficiency. You have tool boxes that hold a full set of tools. You have a machine that's easier to trail and spots by hand. And you have the most efficient rotary compressor unit built, producing air at slower engine speeds, low temperatures and with fuel economy that is money in the user's pocket.

Jaeger Rotaries are also available in 365 and 600 cfm sizes, for larger work. For complete information or demonstration, see your Jaeger distributor — or send for latest Catalog JCR5.



Model "600" Air-Plus Roto — 600 c/m at 100 psi

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 218

Marion names distributor

State Equipment Co., Inc., Vermont Route No. 2, Montpelier, has been appointed a distributor of the complete line of crawler and rubber-mounted excavators made by the Marion Power Shovel Co., Marion, Ohio. The new dealer will cover the entire state of Vermont. Gordon H. Johnson is manager of State Equipment.

modernistic building
Rish Equipment
any's branch at 101
Westwood Avenue,
, Ohio.

Some of the earthmoving equipment distributors attending the 3-day showing held by the Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc., discuss one of the units in the scraper line.

Wooldridge holds showing of complete scraper line

The Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., was host to a group of earthmoving equipment distributors at a recent display of the Wooldridge line of scrapers.

The introduction of new scraper and hauling unit models occasioned the gathering. Prototype equipment representing new models undergoing field tests was also displayed.

Baldwin-Lima-Hamilton names three dealers

Three new distributors to handle its line of shovels, cranes, draglines, and pull shovels have been appointed by the construction equipment division of Baldwin-Lima-Hamilton Corp., Lima, Ohio.

Southern Equipment Sales, Inc., 980 S. State St., P. O. Box 1787, Jackson, will cover the southern half of Mississippi. In Florida, Mineco, Inc., Box 822, Bartow, will handle the line in the southern portion of the state.

Hall-Perry Machinery Co., with offices in Butte, Billings, and Great Falls, Mont., will cover the entire state with the exception of Lincoln, Mineral, and Sanders counties.

Bucyrus-Erie appoints new Kansas distributor

Oehlert Tractor & Equipment Co., Inc., Salina, Kan., has been appointed a distributor in the northwest section of the state by the Bucyrus-Erie Co., South Milwaukee, Wis. The firm will handle a full line of excavators and cranes.

In addition to its main plant at 201–03 West Pacific in Salina, Oehlert will also offer sales and service from branch plants in Hays and Colby.

New Baker-Raulang dealer

W. W. Munroe Co., St. Louis, Mo., has been appointed a distributor of industrial material-handling trucks manufactured by the Baker-Raulang Co., Cleveland, Ohio. In addition to metropolitan St. Louis, Munroe will also cover southern Illinois and eastern Missouri.

Prime-Mover names dealer

Covering the states of Arkansas and Oklahoma as distributor of powered carts manufactured by the Prime-Mover Co., Muscatine, Iowa, is R. A. Young & Son, Inc., Fort Smith, Ark. Young also maintains offices in Little Rock, Ark., and Tulsa, Okla.

(Concluded on next page)

they both have a problem of 'skin protection'

Certainly you'll agree that a woman's sensitive skin needs protection. But did you, as a construction man, ever stop to think how important this matter of skin protection is for your scaffolding?

For instance, if your scaffold is rusted (which is normal unless you spend many costly dollars for maintenance) you'll have a tougher time assembling and dismantling it because of the rough pitted surfaces caused by rust. What's more, rusted scaffolding has shorter life . . . because rust means deterioration.

If, then, your rusted scaffold erects slower and has shorter work life, isn't it costing you profits?

The answer lies in the new UNIVERSAL EZEBILT SCAFFOLDING with its *galvanized* protective coating. Now every single part of this quality scaffolding is covered with a lastingly-smooth, lubricative surface of galvanizing – it resists rust, erects faster, lasts longer, and looks better on the job. *At no extra cost,* Universal galvanized answers the most urgent need in the scaffold industry since the no-loose-parts feature of Gravity-Lock. Insist that your scaffold be galvanized – Universal galvanized.

UNIVERSAL *the only* **GALVANIZED SCAFFOLD**

UNIVERSAL MANUFACTURING CORP. • ZELIENOPLE 1, PA.

Send for catalog describing the panel types and sizes for all construction, mason, or maintenance applications.

Local Distributors everywhere with Rental or Sale Stocks of Universal galvanized scaffolding and American-Tubular elevating towers

For more facts, use Reader-Reply Card opposite page 18 and circle No. 219

Distributor notes

Western dealers for Straub named

Three new western dealers have been named to handle sales of the Kue-Ken crushers made by Straub Mfg. Co., Inc., Oakland, Calif.

Arizona will be served by O. S. Stapley Co., Phoenix; Colorado and New Mexico will be handled by Union Supply Co., Denver, Colo.; and Wyoming sales will be handled by Moss Equipment & Supply Co., Casper.

Clark names three firms to handle Michigan line

The Clark Equipment Co., Benton Harbor, Mich., has named three distributors of Michigan tractor shovels and excavator cranes. Merts Equipment Co., P. O. Box 331, 300 S. Slappey Drive, Albany, Ga., will cover 16 counties in Georgia.

All but 16 counties in Arkansas will be covered by R. A. Young & Son, Inc., 301 S. 10th St., Fort Smith, Ark. Mainline Equipment Co., Inc., 818 S. W. 9th St., Des Moines, Iowa, will handle the line in 18 counties.

New Galion distributor

Brown-Clark Equipment Co., Inc., Richmond, Va., has been appointed a distributor of dump bodies, hydraulic hoists, and Load-evator hydraulic end loaders by the Galion Allsteel Body Co., Galion, Ohio. The company will operate a complete service and parts department as well as a fully equipped body and hoist mounting shop.

R. L. Brown, Jr., president of the firm will direct sales.

Line marker

■ The M-B Corp. has released a bulletin covering the M-B LineMaster, a new low-cost self-propelled line marker. The bulletin gives specifications for the marker and explains in detail such features as automotive steering, Shift-O-Matic drive, large paint capacity, and single, double, or intermittent marking. Descriptions of other M-B line marking equipment are also included.

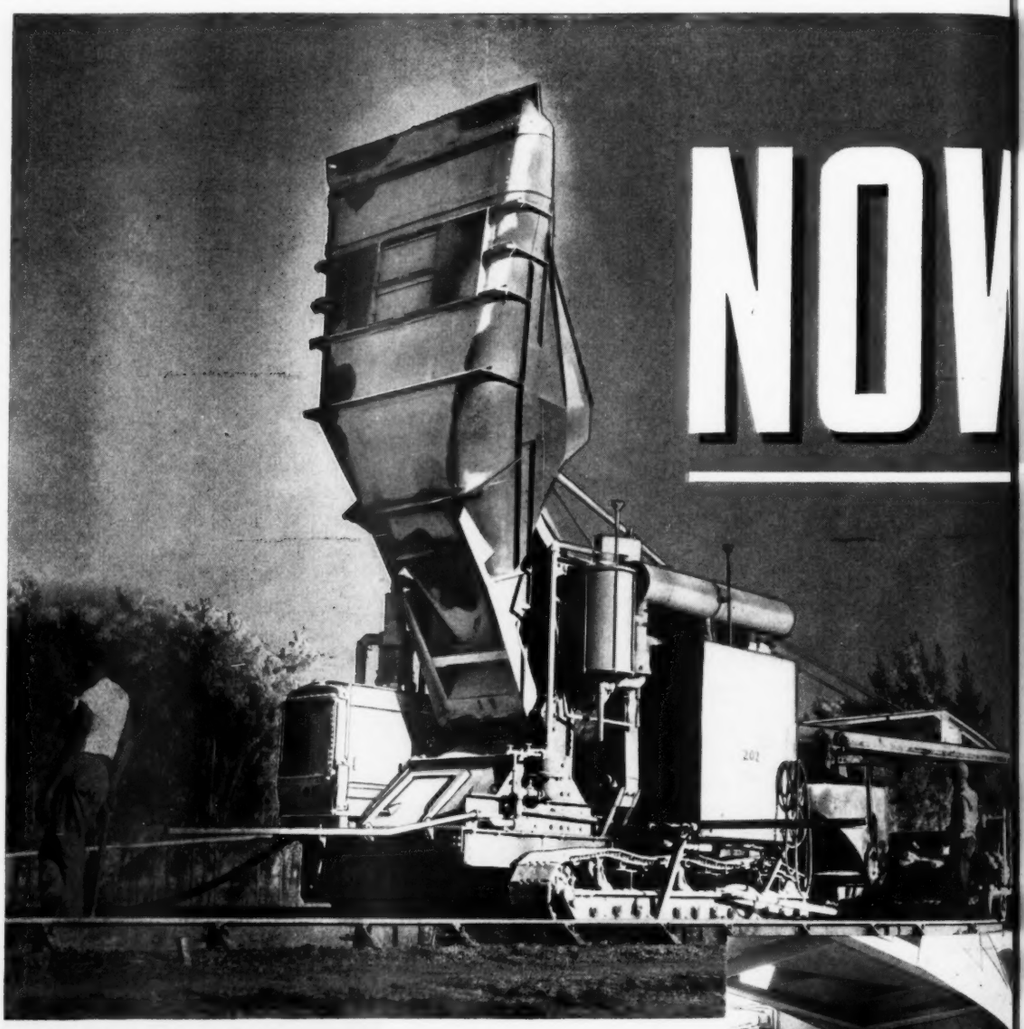
To obtain this bulletin write to the M-B Corp., 1635 Wisconsin Ave., New Holstein, Wis., or use the Request Card at page 18. Circle No. 157.

Conduit structures

■ Various types of clay conduit structures produced by the Heat Transmission Conduit Co. are discussed in a bulletin from the firm. Featured are Ht armored clay conduit and Ht Clay-Con segmental tunnel structures. The clay systems illustrated are the original and pioneer types on the market continuously since 1910. Engineering and specification data and diagrams are included.

To obtain Bulletin 56 write to Heat Tranmission Conduit Co., 2300 Payne Ave., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 71.

FOUR distributors for Barnes Mfg. Co. display 20-year citations awarded them at the annual AED meeting in Chicago by F. B. Hout, vice president of Barnes, (extreme left) and W. D. Schneider, Barnes manager of pump sales, (extreme right). The dealers, left to right, are L. R. Richards, Richards Equipment Co., Waco, Texas; P. A. Ransome, Giles & Ransome, Philadelphia, Pa.; E. L. Huebner, Huebner Machinery & Supply Co., Saginaw, Mich.; and J. D. Evans, J. D. Evans Equipment Co., Rapid City, S. Dak.



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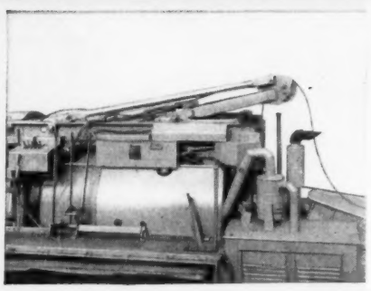
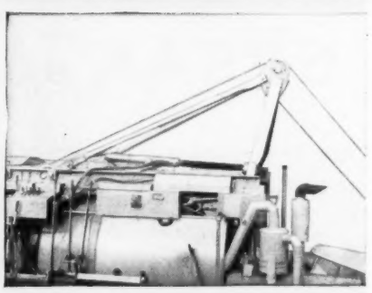




A-Frame Down

With the A-Frame in the down position, as shown at upper left, the MultiFoote Paver overall height is instantly reduced to clear bridge or overpass. This low clearance not only facilitates traveling under low overhead structures but also aids in transporting.

A-Frame Up

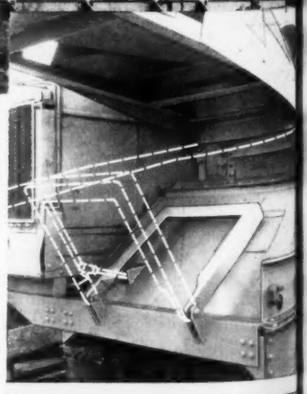
By touching a hydraulic control lever the A-Frame is quickly raised and the MultiFoote is ready for operation, as shown in lower left. With this arrangement the MultiFoote Paver has retained all the advantages of single cable operation.

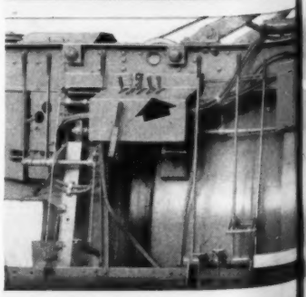
Skip Carrier

When traveling with the A-Frame folded down, the skip rests on a hydraulically controlled skip carrier, as shown by the dotted lines in the photo at upper right. When the paver is working, the bracket folds down against the frame, out of the way.

Operator's Platform and Controls

Five small finger operated levers in the picture at lower right control hydraulic cylinders which actuate A-Frame, skip carrier bracket, transfer, discharge and bucket spotting. All controls are centrally located for ease and speed of operation.





The G29 Roto-Trowel is powered by a 2.2 hp engine.

Trowelling machine only 29 inches in diameter

■ A new lightweight, 3-bladed trowelling machine that is just 29 inches in diameter is announced by the Stow Mfg. Co.

The G29 Roto-Trowel, is recommended for building or construction crews doing concrete floor work. Because of its small size, it can easily be carried around the job and through doorways by just one man. On large jobs, it is useful for putting on slabs that for one reason or another are too soft for the larger, heavier machines.

Powered by a 2.2 hp engine, the unit trowels at speeds from 25 to 100 rpm. It has combination float and finish blades that are reversible for double life. It also features handle that can be adjusted to suit the height of the operator. The belt is guarded for safety, and a hook is provided on top of the engine for lifting to upper stories.

For further information write to the Stow Mfg. Co., 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 156.

NEW LOW CLEARANCE HEIGHT and COMPLETE HYDRAULIC CONTROLS make the MULTIFOOTE even better

New Design Cuts Cycle Time by giving you Faster Skip Operation
PLUS—faster travel preparation • faster bucket spotting • faster discharge

MultiFoote Pavers with these new hydraulic controls and faster skip operation give you an even faster cycle time than before, *plus a new low overall clearance height.* You get all the advantages of single-cable skip control with its high speed, simple reeving and low maintenance cost. Now in a matter of a few seconds, the operator can raise the skip carrier bracket and lower the A-frame with fast-acting hydraulic cylinders to get under overpasses, bridges or other low overhead clearances.

Hydraulic controls also step up the high capacity of the MultiFoote by faster batch transfer, faster discharge chute operation and faster bucket spotting. These hydraulic controls plus the faster skip operation now mean that you can put out more concrete with a Blaw-Knox Paver than any other paver.

All the features that have made MultiFoote Pavers the leaders in their field have been retained or improved. The efficient double-cone drum folds material over and over for thorough mixing, has no corners for material to build up in and cleans itself with a scouring action. High operator's platform gives the operator an unobstructed view of skip and bucket at all times—there are no "dead spots." Efficiently grouped controls for manual and automatic cycle operation cut seconds out of the mixing time for each batch. Shovel-type crawlers with their self-cleaning action give positive traction, ample flotation on soft grades and are designed to stand up to miles of highway paving travel. Volume measurement, non-pressure water system that is unaffected by grade, the wide, smooth rigidly mounted skip and simplicity of design assure shift-after-shift high capacity and easy upkeep.

If you are bidding on turnpike work or any big paving job, see your Blaw-Knox Distributor and get all the details on the New MultiFoote with hydraulic controls.

BLAW-KNOX

BLAW-KNOX COMPANY
Construction Equipment Division, Mattoon, Illinois
40 Charleston Avenue

New torque converter comes in ten models

■ The Twin Disc Clutch Co. has announced the new three-stage Series 13,800 torque converter which is adaptable to every horsepower range between 60 and 600 through manipulation of its blades. The manufac-

Twin Disc's 13, 800 Series torque converter.

turer now can offer torque converters of four distinct sizes and a total of 29 capacities (40 to 1,000 horsepower) through internal blade variations.

The Series 13,800 is planned around a basic unit with easy-to-add components which produce ten specific models. Two output and three input arrangements are available. The series fits new SAE standard flywheels and accommodates both 0 and 00 housing sizes.

The converter fits a large variety of engines, including those manufactured by Caterpillar, Allis-Chalmers, Cummins, Fairbanks, Waukesha, and Fairbanks, Morse. Adaptations to various engine speeds is accomplished by changing the blade angle in the converter or by varying the number of blades.

For further information write to the Twin Disc Clutch Co., Hydraulic Division, Rockford, Ill., or use the Request Card at page 18. Circle No. 173.

Joint compound for dams

■ Rubber waterstop, an elastic, cured-rubber compound for sealing expansion joints in dams, water works, sewage treatment plants, and hydroelectric installations, is detailed in a brochure from Servicised Products Corp. Installation and typical applications are described, and variations of vertical, flat, and gate seals are diagramed. Also shown are split-type and field spliced applications.

To obtain this brochure write to Servicised Products Corp., 6051 W. 65th St., Chicago 38, Ill., or use the card at page 18. Circle No. 32.

←For more facts, circle No. 220

Heavy ripping work eases grading for mountain road

Excavation totals 1,750,000 yards in 4-1/2-mile highway project; winding, steep haul roads lengthen distance between cuts, fills

by **RAY DAY**

Equipped with an Ateco heavy-duty ripper, the powerful Cat D9 breaks up ground that would otherwise be drilled and shot. The combination is also used to aerate material too wet to be used immediately in the fills.

A 1,750,000 cubic yard excavation job, included in a 4.04-mile highway project being built through the heavily timbered mountains above Shasta Reservoir in Shasta National Forest, gave the new Caterpillar D9 one of its best opportunities to show the kind of work it could do with heavy ripping equipment. Materials in this section include almost the full range of those found in northern California, including lava cap rock formations, shale, sandy clay, and gravelly soils. This big grading operation included three cuts 180 to 190 feet deep, and several fills more than 160 feet high. One fill contains 300,000 cubic yards of material, another contains 580,000 cubic yards. And in one 100-foot stretch, about 135,000 cubic yards of material had to be handled.

All this work is part of the construction of a highway on a new alignment through this mountainous country by Piombo Construction Co., San Carlos, Calif. This firm's job also includes the production and placement of a granular subbase course, plant-mix asphalt surfacing, work on drainage structures, and construction of a steel girder reinforced-concrete bridge across Slate Creek.

This road will replace an old narrow roadway with twisting curves that has long been obsolete. Scheduled for completion this summer, the road has a limited-access type of construction and has been designed for axle loads of 18,000 pounds. It is being built to freeway standards. The twin 30-foot paved surfaces are separated by a narrow median at the brows of hills where sight distances might be questionable, but on the straightaways the slabs are adjacent, forming a 60-foot paved surface.

Heavy grading

Clearing, started in the spring of 1955, was relatively simple. Two tractors and a small crew kept the right-of-way preparation well ahead of other work.

But the grading work was tougher. Lava cap rock formations, solid, and so saturated with ground water that a mud streak was created underneath, were found in some areas. Heavily embedded shale, some of it almost solid rock, was found in large amounts. A red, sandy clay, and some gravelly soils were also present in the short stretch. All of this made good roadbuilding material.

Excavation and fill balance points were seldom more than 800 feet apart, but since the country was so rugged, haul roads had to be built down the sides of steep hills and around other hills so that the tops of the cuts tied in with fill locations. These roads made haul distances longer, and on one 800-foot haul, brought the total distance to 2,000 feet.

Drilling and shooting

The 15-foot cap rock layer of lava, covering softer material in one of the cuts, and some granite pockets deeper than 15 feet had to be blasted. The granite formations were easier to handle, since the force of the high explosives could be confined within the rock where it did the most damage. Powder tended to explode down into softer materials when the cap rock was blasted, making it necessary to do secondary drilling and shooting after the first blast had rolled big chunks of cap rock—6 feet in size—up on end.

Drilling equipment on the spread included a Joy 630-cfm compressor, a Jaeger 600-cfm machine, Gardner-Denver compressors in 500, 315, and 105-cfm models, and a Chicago Pneumatic 125-cfm unit. Working with these compressors was a Gardner-Denver heavy-duty drill mounted on an Air Trac carriage, a Gardner-Denver wagon drill of conventional type and two Joy wagon drills. Numerous hand-held jackhammers were used for shallow drilling and slopeline work.

Drill holes were spaced according to the type of formation being blasted. Wagon drills using 2½-inch-diameter bits commonly put down holes on 5-foot staggered centers, while the big Gardner-Denver, drilling a 3½-inch-diameter hole, worked on spacings up to 9 feet in many formations. The latter machine worked from an Air Trac carriage, a small unit with tracks faced with tough fiber and rubber shoes. Each individually controlled track has plenty of power, enabling the drill carriage to climb a 20 per cent slope or move around in a tight location. The rig punches a drill bit through cap rock at an average speed of about a foot a minute. The steel or drill bit did not stick in the mud seams underneath the cap rock either, since the machine had ample power to drill its way out.

The Caterpillar D9, equipped with a 14-foot bulldozer blade, helps a Cat DW20 to pick up a heaping load of rock and earth. In some places, scrapers dropped down a 400-foot, 50 per cent slope.

Carrying a heaping load, a Cat DW20 heads down a steep haul road to a fill area. Though some cut and fill sections are close together, some of these roads had to be built around hills, making the total haul distances longer.

It was impossible to drill with 20 foot steel in some of the deeper rock cuts without reaching bottom grade. In these cases, holes were sprung before main powder loading was done. When holes went to grade, crews were careful to avoid over-drilling or breaking. The holes were column-loaded with Herculite 40 per cent bag powder, and delays were used, as necessary, to break slope lines and the floor grade clean.

The broken banks of rock were loaded out by two Northwest Model 80-D shovels with 2½-yard dippers. Nine Euclid end-dump trucks and six Peterbilt trucks were used to haul away the blasted rock, which was used in the lower part of high fills.

Tractor equipment at work on this spread included 18 Caterpillar D8's, some of them the new supercharged models. Two Caterpillar No. 80 scrapers, three Wooldridge 25-yard scrapers, two LeTourneau W's, six Cat DW20's, and a Cat D9 with 14-foot bulldozer blade and center push block completed the spread. The latter machine was also fitted with an Ateco heavy-duty ripper for work in shale.

The work of all this equipment was hardly routine. In some high places where deep cuts were required, the D9 and 14-foot bulldozer blades were used. Where room was scarce, a D8 with tilting angledozer blade went to work. All the steep locations required an adequate pioneer road to be made so that loaded hauling units would have a safe footing to get down the steep grades without rolling over. In some cases, loaded DW20's had to get down a 400-foot-long 50 per cent slope.

In these high places, grading followed a pattern. After the pioneer road had been established, the big Cat D9 with a rear-mounted Ateco ripper moved in to loosen the formation. Working with a D8, which operated near the slope line, the D9 began shoving dirt off the edge of the road. The DW20's then moved in, and these were given a push-loading assist by the D9. Loaded scrapers dragged their scraper bowls to hold themselves back as they made the steep descent to the fill.

The considerable amount of ripping done by the D9 had a two-fold purpose. Deeper cuts sometimes began to bleed ground water from hidden springs, and since many areas contained material that was too wet to be used in the fills, preliminary ripping, then secondary ripping by the Cat and Ateco ripper, completed a good aerating job. Ripping was done over a wide area on sunny or windy days if an appreciable amount of ground water was present.

The placing of fill material was routine. Much of the broken rock and shale was simply dumped in thin lifts, then rolled by sheepsfoot or steel-wheel equipment. Three Southwest 5×5 sheepsfoot roller units, five smaller sets of Southwest sheepsfoot rollers, and a 3-wheel Buffalo-Springfield steel-wheel roller, were used on this work. Fills were constructed so that there was no sponginess at the bottom, permitting extra compaction to be applied at the surface to develop the 95 per cent density required.

Scrapers are being used on short-haul work, where a fill is adjacent to a cut. Pioneering, loading, and aerating were done in the same manner as on the DW20 spread.

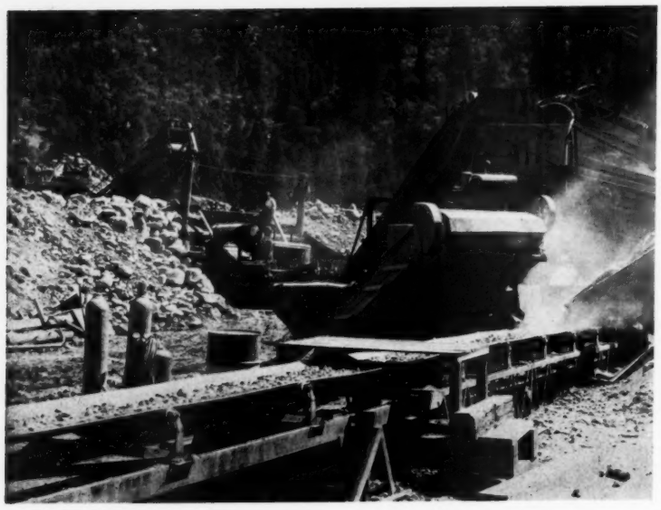
Other equipment in the contractor's lineup included a P&H truck-crane for general work, an Insley ½-yard machine that was primarily used for concrete placing, and two Caterpillar No. 12 motor graders that were assigned to haul-road maintenance and slope dressing.

Rock crushing job

Grading had hardly been given a good start when a rock-crushing and screening plant with a washing unit was set up near the site to produce aggregates needed for the Slate Creek Bridge and concrete drain structures, along with material for the granular base and leveling courses, which are

A 3½-inch blast hole is put down in the rocky formation by a Gardner-Denver heavy-duty drill mounted on an Air Trac carriage.

Aggregates for concrete, base, and hot-mix are turned out by this crushing setup. Material dozed to the primary crusher moves to the primary and secondary rock plants and is delivered to surge bins on the other side of the railroad by a conveyor belt running through a culvert.



Several graded sizes of aggregates are blended on the main conveyor belt that runs under the tracks of the Southern Pacific Railroad. Material is dozed to the crusher by a Cat D8 tractor.

As pier forms are prepared, an Insley crane (right background) places concrete for an abutment footing. At left is part of an approach fill being built up for crossing.

required as subbase ballast. Mineral aggregates for hot-mix paving will also be produced by this plant.

Consisting of a primary crusher, a primary rock plant, and a secondary rock plant, the unit was set up near a concrete culvert by the Sacramento River bottom. The culvert, passing underneath the tracks of the Southern Pacific Railroad's main line, was used to deliver aggregates to the surge bins on the opposite side of the tracks.

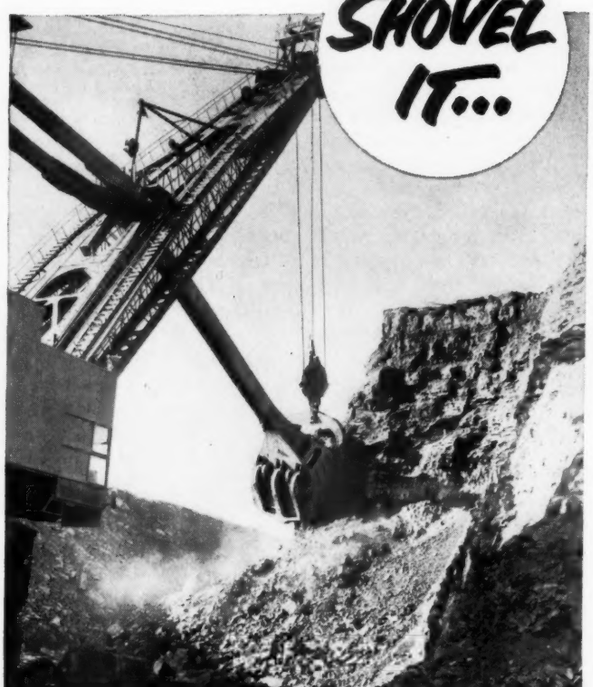
The rock pit, a well-graded alluvial deposit, contains material ranging from fine particles to boulders up to 15 inches in diameter. The crushing ratio on 1½-inch-minus rock is about 65 per cent. Native material, fed to the plant by a Caterpillar D8 with U-dozer, goes first to a Cedarapids 4×10 apron feeder mounted at the bottom of the trap. All material passing this feeder then goes to a Cedarapids 25×40 jaw crusher, which is set in the line to crush the large-size rock and prevent it from getting caught in the plant later.

Leaving the jaw, the material travels a 30-inch-wide 55-foot-long conveyor to a shop-built 6×8-foot grizzly that passes 3½-inch-minus material to the secondary plant. Material retained by the grizzly goes to a 15×36 Austin-Western jaw crusher for further reduction. Another 30-inch-wide and 55-foot-long conveyor belt takes this material to the secondary plant.

This secondary plant is arranged in a closed circuit with a set of Pioneer 4×12-foot vibrating screens. The main components of the plant include a Pioneer 10×36 jaw crusher, a conveyor leading to a set of Cedarapids 4×12 vibrating screens, and a Pioneer 40×22 roll crusher.

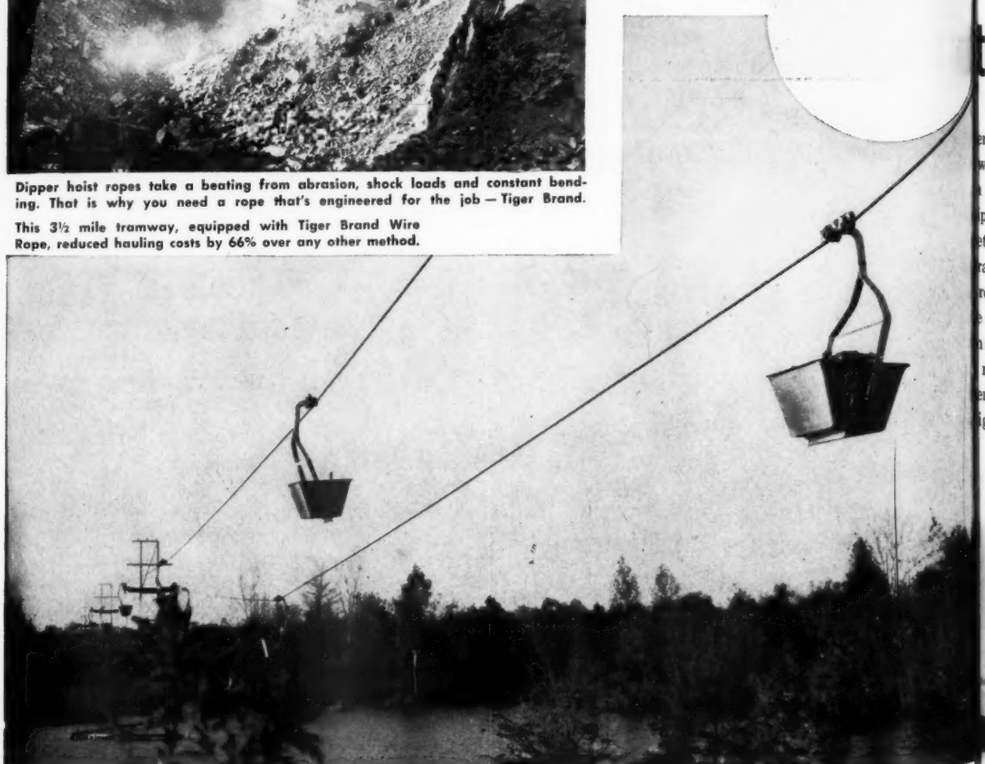
A 225-foot-long 30-inch belt conveyor carries the finished product under the Southern Pacific railroad tracks to a 60-foot-long 30-inch-wide run and a 125-foot-long 30-inch-wide run which stacks the aggregate in a pair of 30-yard steel bunkers. These have 4×12-foot Symons vibrating screen decks mounted over their tops. These screens are not needed

WHETHER YOU SHOVEL IT...



DRAG IT...

OR HAUL IT BY



Dipper hoist ropes take a beating from abrasion, shock loads and constant bending. That is why you need a rope that's engineered for the job — Tiger Brand.

This 3½ mile tramway, equipped with Tiger Brand Wire Rope, reduced hauling costs by 66% over any other method.

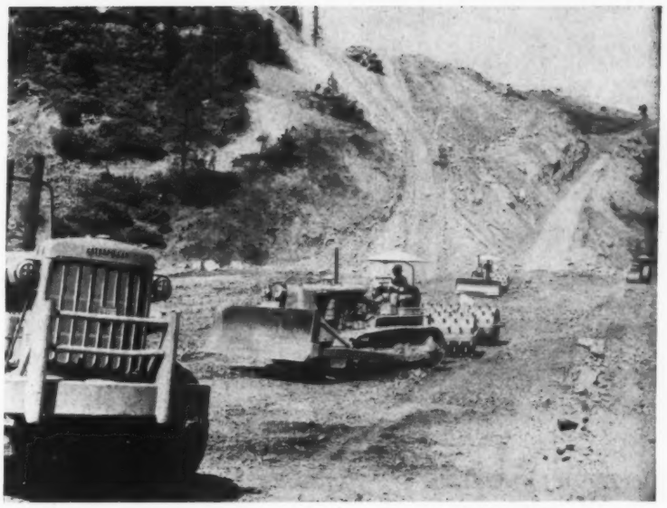
when base-course material is being produced, but they were of use when concrete aggregates had to be blended. When concrete aggregates were run, a sand washer was used in the line to remove decantable material and wash the ⅜-inch-minus fraction.

Aggregates are hauled away from the plant by a fleet of Peterbilt dump trucks and stockpiled temporarily about a mile beyond the north end of the job at the batch-plant site.

Concrete structures

Standard form prefabrication, field assembly, and conventional pouring methods, are making concrete work routine on Slate Creek Bridge, a horseshoe-shaped drain tunnel for a small creek, and the minor structures included under this contract. Forms consist of plywood facing nailed to 2×4 studs, with doubled 2×4 studs as wales, and Burke form bolts are used to hold opposite faces in line. Panels, turned out in a central yard by power-saw equipment, are assembled and fitted in the field.

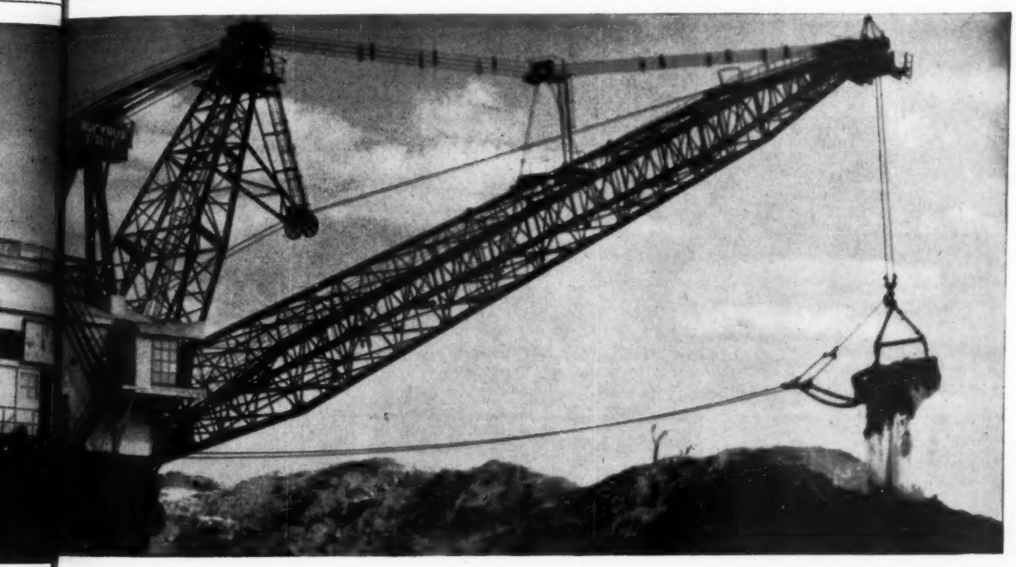
Concrete is being turned out by a Noble manual-type plant, set up about a mile beyond the north end of the project. A Michigan loader charges the bins, and Permanente cement is supplied from a storage silo. Three Jaeger truck-mixers haul concrete from the plant to the pours, where actual placement is done by Gar-Bro buckets handled by an Insley crane. Several electrically driven Homelite vibrators are consolidating the mix, and the fresh concrete is being cured with Sealtex membrane cure.



As Southwest sheepsfoot rollers are pulled by Caterpillar tractors to compact a fill, a Cat DW20 comes over a ridge with another load. Scrapers dragged loaded bowls on the steep slopes to check their speed.

Dirt work on a 5-day week and averaging 10,000 cubic yards per 9-hour day, together with rapid construction of the Slate Creek Bridge, will permit this entire job to be completed this summer. Field supervision for Piombo Construction Co. is being done by general superintendent P. J. Dunn. His assistant is Bud Kerr, and M. H. Griggs is in charge of concrete work. Tommy Thomas is office manager. The work is being administered by District II of the California Division of Highways at Redding, with W. H. Jacobsen as resident engineer.

THE END



Tiger Brand Drag Lines have a reputation for keeping costs down by moving more cubic yards per rope.

...By AIR... Tiger Brand delivers top yardage per dollar spent for wire rope

...n you are moving materials in a ...way, the cost per cubic yard may ... deciding factor in the type of ...pment and wire rope you select. ...ether you use shovels, draglines ...ramways, the problem is to pick ...rope that will give the best pos... service on your job.

...n shovels, Tiger Brand Wire Rope ... run up some amazing records. ...r Brand shovel hoist ropes are ...igned to combine flexibility, strength and resistance to abrasive wear as required by this class of service.

On draglines, where a lot of abrasive wear and abuse are encountered, Tiger Brand drag ropes have demonstrated time and again that the right rope for the job is the most economical.

For tramways, Tiger Brand track cables and traction ropes are recognized leaders.

For a personal guide to rope selection, send the coupon.

American Steel & Wire Division
Rockefeller Building, Dept. O-46
Cleveland 13, Ohio

Please send me your Wire Rope Recommendation Book, "The Right Rope for the Job."

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

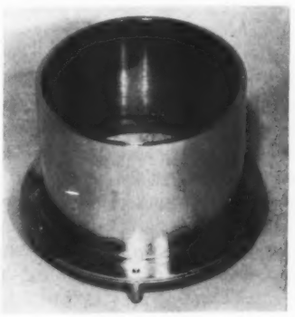
USS

UNITED STATES STEEL

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 221

New, durable sieve for cement analysis

■ The Long Life sieve is recommended by Custom Scientific Instruments, Inc., for reducing the cost of routine hourly sieve analysis of cement.

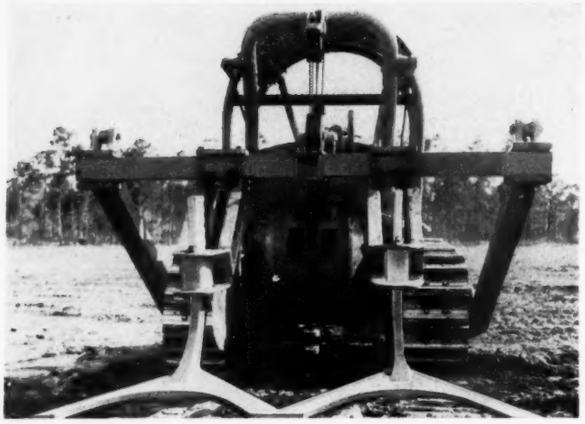


Long Life sieves are constructed of chrome-plated brass for greater durability.

Savings are realized, the manufacturer states, because the screen alone can be replaced upon failure, while the sieve can be used over and over again.

The frame of the sieve is constructed of chrome-plated brass, and the screens meet ASTM specifications.

For further information write to Custom Scientific Instruments, Inc., 541 Devon St., Kearny, N. J., or use the Request Card at page 18. Circle No. 128.



A Cat D7 tractor with the Fleco No. 7 tool bar and two of the new TB-RC-7 root cutters. Screw jacks provide an ample range of adjustment of the tool beam to match a variety of tools and operations.

Heavy-duty tool bar fits rear of tractor

■ A new tool bar for use with the Cat D7 diesel tractor has been announced by the Fleco Corp. It measures 6×7½×124 inches and is designed to accommodate such tools as subsoilers and chisels and the newly developed Fleco TB-RC-7 root cutter, a V-shaped unit that operates from 3 to 26 inches below the ground.

The heavy-duty No. 7 tool bar is made for use with rear-mounted cable control units and can be mounted without intereference with front-end equipment. The tool beam is a one-piece steel casting.

The tool bar has ample adjustment range made possible by screw jacks for adjusting the tool beam to match the tools and the type of operation required.

For further information write to the Fleco Corp., P. O. Box 2370, Jacksonville, Fla., or use the Request Card at page 18. Circle No. 149.

Welder and power unit

■ A combination welder and power unit called the Weldanpower is featured in a bulletin from Lincoln Electric Co. The 200-amp welder is recommended for welding, hardsurfacing, heating, and soldering. As an ac-power unit it supplies 4 kva for continuous duty, and 5 kva for intermittent standby power. The unit is said to supply adequate power for driving electric pumps, running chain saws, and supplying emergency power.

To obtain this bulletin write to Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 27.

Clear-span roofs

■ The Teco connector system for clear-span roof construction in hangars, bridges, supermarkets, factories, warehouses, towers, and stores is presented in a catalog from Timber Engineering Co. On-the-job photos of this system show how it works. Also pictured are examples of the three principal methods of engineered timber construction—the Teco connector, glue laminated, and Lamella systems.

To obtain this catalog write to Timber Engineering Co., 1319 18th St. N. W., Washington 6, D. C., or use the Request Card at page 18. Circle No. 49.

Synthetic rubber

■ A new synthetic rubber, Hypalon, is highly resistant to heat, weather, oil and grease, chemicals, and abrasion, according to a catalog from E. I. du Pont de Nemours & Co. Photographs show how this chemical rubber can be used for acid hoses, tank linings, gaskets and packings, hot-material belts, spark plug boots, and protective coatings.

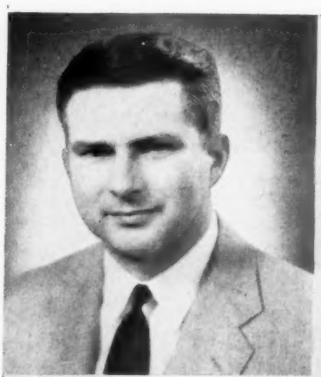
To obtain this catalog write to E. I. du Pont de Nemours & Co., Elastomers Division, Wilmington 98, Del., or use the Request Card at page 18. Circle No. 95.

Clark Equipment offers a practico

this Vital Area:

TRANSMITTINE

These Men Are Your "Contacts" With CLARK —— concerning design problems and s



HARRY B. STONE

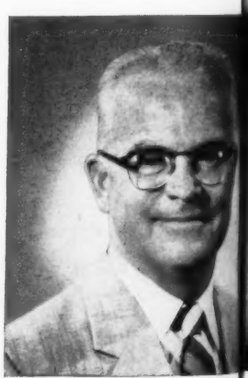
Clark Equipment Company
Buchanan, Mich.

Mr. Stone, Supervisor of Distributor Sales for Clark Equipment, is an engineer and sales executive of 19 years experience with leading automotive equipment builders.

RENKE BRUNKEN

Brunken Corp.,
710 Knollwood Avenue, Ashtabula, O.

Renke Brunken handles Clark automotive line from Maine through the Carolinas, Penna., eastern Ohio. Eminent engineer, Torcon founder, Mr. Brunken is a power-transmission authority.



NICHOLAS A. D'ARC

Nicholas A. D'Arcy, Jr.,
7535 Marbrisa St., P. O. Box
Huntington Park, Calif.

Clark automotive products sold California, Arizona and Nevada handled by Mr. D'Arcy, long rienced in heavy equipment, chanical engineer.

WADE A. ESKRIDGE

Wade A. Eskridge,
403 S. Peoria St., Tulsa, Okla.

Southwest District Supervisor and outstanding automotive engineer, Mr. Eskridge heads the Clark field office in Tulsa, a complete facility for technical aid, prompt service and parts inventories.

HARLAN C. McKAY

Harlan C. McKay Company
2950 S. W. Vista Drive, Portland 1, Ore.

The McKay company sells and services the Clark automotive line in the Pacific Northwest, Br. Columbia, Alberta and Alaska. Mr. McKay knows power needs of logging, contracting, transportation.

MAX RIC

Richler Automotive Corporati
836 Wellington Street, Montreal 3, Q

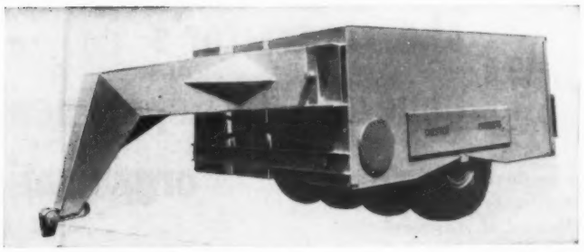
Max Richler and his brothers established equipment house, Clark's automotive line in On Quebec; with service facilities parts at Montreal and Toron

Manganese steel parts

■ A line of manganese steel replacement parts and units is described in a booklet from the Manganese Steel Division of The Frog, Switch & Mfg. Co. Photographs, diagrams, and descriptions of parts for all types of crushers, pulverizers, shovels, draglines, cranes, clamshells, mixing machinery, and screening equipment are included.

To obtain this booklet write to the Manganese Steel Division, The Frog, Switch & Mfg. Co., Carlisle, Pa., or use the Request Card at page 18. Circle No. 165.

50-ton pneumatic-tire compactor augments line of roller equipment



The Chester Model 50T4 exerts 1,250 pounds of ground pressure per inch rolling width.

■ The Chester Products Co. has added a 50-ton rubber-tire compactor to its line of roller-type compaction equipment. The new rig has been designated the Model 50T4.

Each of its four 18:00×25, 20-ply-tire wheels is individually assembled to a ballast compartment exerting a maximum load per tire of 25,000 pounds. All compartments are hinged about a 12-inch-diameter pivot axle permitting oscillation of up to 24 inches. There is 1,250 pounds of ground pressure per inch rolling width.

The compactor has a turning radius of 10 feet. A gooseneck-type heavy-duty drawbar provides balance, maneuverability, and universal hitching to any prime mover, according to the manufacturer.

Three models of dual-drum tamping rollers are also manufactured by the firm. Each has a channel-type frame and sealed Timken bearings for easy conversion to or from a single drum roller.

The Model 1760 has a drum diameter of 40 inches and a width of 48 inches. It weighs 10,487 pounds with water ballast and exerts 200 psi with sheeps feet. The manufacturer claims a 35 per cent increase in psi with the use of optional round feet. Front and rear stationary cleaning bars are standard.

A similar rig is the Model 4840. It weighs 18,284 pounds with water and sand ballast and develops 405 psi. Drum size is identical with that of the smaller model. It contains 104 feet per drum, however, as compared to 88 for Model 1760. Adjustable cleaning bars are standard on the rear and optional on the front. Round or sheeps feet are optional.

Giant of the Chester line of tamping rollers is the Model 6060. It has a drum diameter and width of 60 inches, and contains 120 feet per drum. Total weight with wedge-type feet and sand and water ballast is 43,128 pounds, or 1,450 psi. Adjustable front and rear cleaning bars are standard.

For further information write to the Chester Products Co., N. Fifth and Ford Blvd., Hamilton, Ohio, or use the Request Card at page 18. Circle No. 172.

Rubber-asphalt additive

■ A dry synthetic-rubber additive for bituminous concrete, Surfa-Sealz, is featured in a folder from Naugatuck Chemical Division. Added to standard pugmills in hot-mix plants, free-flowing Surfa-Sealz is claimed to give a thoroughly homogeneous mix in a 60-second mixing cycle. A chart points out that 6 to 12 pounds of the additive are required per ton of asphalt mix.

To obtain this folder write to Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, Conn., or use the Request Card at page 18. Circle No. 29.

comprehensive service covering

ENGINE TORQUE

For more than half a century, Clark Equipment has focused its engineering attention on a Vital Area of machinery performance—the Transmission of Engine Torque.

From that planned specialization came Clark axles, Clark transmissions and the Clark one-piece forged axle housing; and finally, as a natural evolution, the Clark torque converter.

Better Power-Trains=Better Machines

When the first Clark fork-lift truck was born in 1927, Clark applied its know-how and torque transmission experience to developing power-train systems for this new type of vehicle.

Again, in recent years, Clark developed a revolutionary power-train for its own newly developed tractor shovel; and almost overnight became a major factor in the construction machinery industry.

What could be more natural than that other manufacturers of agricultural and industrial machinery, recognizing Clark's unique asset of power transmission experience and expertness, should ask for Clark collaboration in developing driving units of functional design for their own products?—ask for it, and get it.

So today it can be said of many modern machines, Clark-built and others: "From engine flywheel to point of power use—torque transmission system designed and manufactured by Clark Equipment."

NOW: A Service to Users

Today that invincibly logical Clark development has an equally logical sequel: a complete Power Transmission Service to users of diesel or gasoline horsepower—from flywheel to point of torque application.

That service is implemented as follows:

- **District Sales Engineers—A nation-wide organization of men fully qualified to help solve technical problems**
- **Independent Equipment Dealers—Long established businesses of high reputation and well staffed; to distribute Clark products direct to users in certain key industries**
- **Adequate Service Facilities—With service parts stocks maintained at strategic points, to provide prompt, accurate satisfaction for users' needs**

As a user of diesel or gasoline horsepower, always on the lookout to get the best possible performance at lowest possible costs, you'll find it good business to establish a working relationship with Clark, through its nearest representative.

H. A. DAVIS

H. A. Davis Power Equip. Co.,
2142 Irving Boulevard, Dallas, Texas
In Texas, Clark's automotive line is handled by H. A. Davis Power Equipment Co., leading distributor, with complete sales, service and parts inventories.

JOHN M. SHANK

John M. Shank Co.,
5 Birchwood Ave.,
White Bear Lake 10, Minn.
Mr. Shank, power equipment veteran, distributes Clark automotive products in Minn., Wis., N. and S. Dakota, Iowa, Nebr., Upper Mich.; and maintains complete service facilities.

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Automotive Division
Transmissions, Torque Converters: Jackson 7, Michigan
Axles: Buchanan 7, Michigan

For more facts, use Reader-Reply Card opposite page 18 and circle No. 222

Management

The contractor's general and departmental organization

This is the fourth of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent and who need practical help in order to take complete charge of construction projects themselves.

by GEORGE E. DEATHERAGE, P. E.
Construction Consultant

A typical modern project, in which every phase of work from design to finished product was handled by one firm, is the Atomic Energy plant at Savannah, Ga., costing more than a billion dollars and employing as many as 50,000 men on construction. E. I. DuPont Co., turning to principles of basic industrial management to reduce as many functions as possible to a routine, had to break the job down into its component parts, with a number of functional specialists in charge of supervision and control.

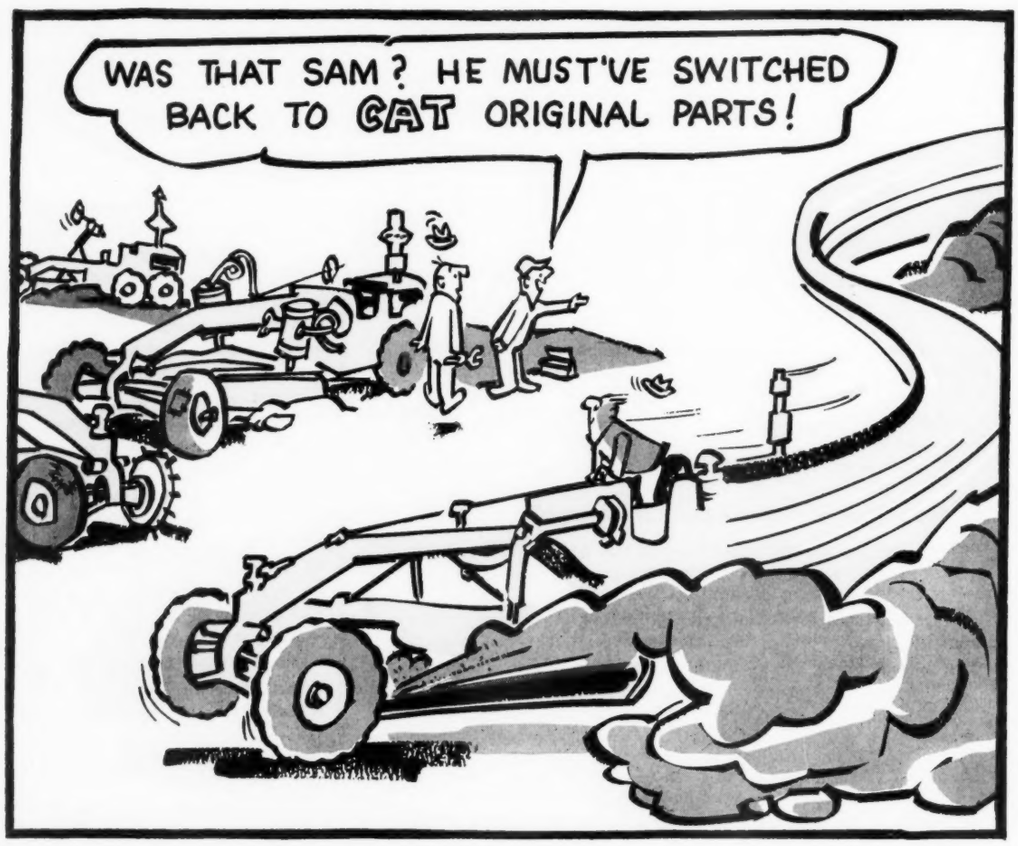
This job illustrates the biggest forward stride taken by the construction industry—the step from overseer to the functional type of supervision. And it has all come about within this century as a result of the adaptation of scientific management as practiced in the manufacturing industries.

Setting up such a systematic procedure on construction jobs will usually be regarded as just a lot of red tape by the average foreman or supervisor. Then too, each construction project runs into distinct problems—problems which are never duplicated on another job. But this type of work—known as the "intermittent type" in manufacturing plants—is largely being done under routine procedures.

The key to adapting manufacturing methods lies in working out methods to be used and machines to be employed for a specific job, rather than leaving decisions to supervisor or foreman. Thus the "standards & methods" engineer works out the procedure to be followed, and the foreman sees to it that the work is done in the manner specified and with the equipment specified. With activities coordinated and control of routine matters established, the foreman is free to devote his full time to getting the best out of the men and equipment on the job.

Two types

The military or line-type organization is the old-time construction organization, with discipline as the essential feature. On small work, this type of organization is still practical. As work grows in size and complexity, the system fails because a few men in responsible positions find it practically impossible to handle their varied duties. Those few organizations using the military-type organi-



Take it from Sam. Beware of "just as good" substitutes.

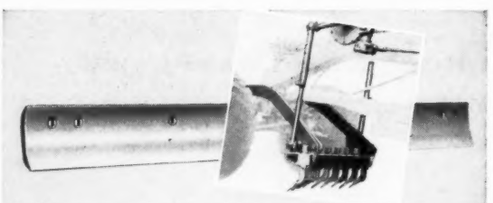
A cutting edge for your CAT* Motor Grader, for example. Caterpillar original cutting edges are made from only top-quality high-carbon steel—carefully pretested. Or scarifiers. If they're Caterpillar, the shanks are strong steel forgings mounted in a heavy cast steel block. Their replaceable teeth of forged alloy steel are selectively heat treated to resist wear.

You're sure of more dependable performance on any kind of job when you use only Cat cutting edges and scarifier teeth.

With substitute parts, can you be sure of anything?

See your dealer's Parts Representative—better get Caterpillar original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Cat original motor grader cutting edges and scarifier teeth are the results of never-ending metallurgical research. They match the all-around performance of the quality machines they work with.

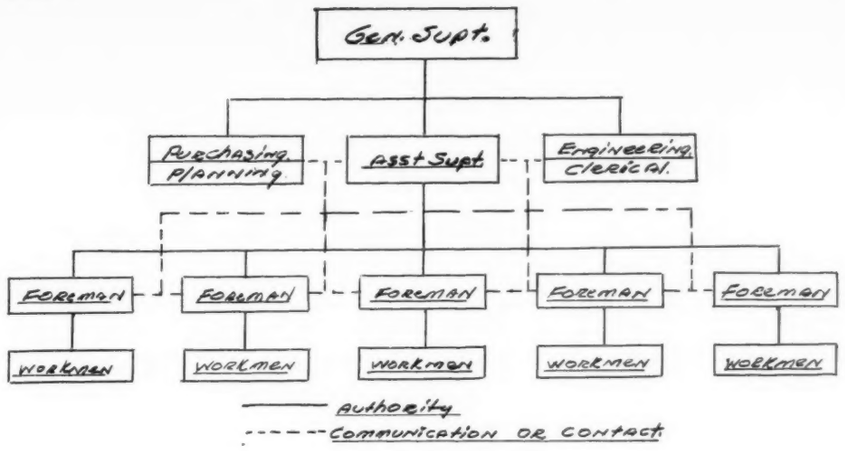
CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

CAT PARTS YOU CAN TRUST

For more facts, use Reader-Reply Card opposite page 18 and circle No. 224

Figure 1.



zation have been successful due to the unusual abilities of a few men.

Line and staff organization, as shown in figure 1, does not require heads of purchasing, planning, engineering, and clerical departments to clear every detail through the superintendent or project manager. These department heads retain control of functions given to them, and are free to communicate directly with field forces on the work. The general superintendent, the assistant superintendent, or both, have a final say in reviews or decisions, but since most items are handled directly between departments and work forces as a matter of routine, only a few items will need attention from the superintendent or his assistant. This leaves the project manager and superintendent with more time to concentrate on getting the job done at the right time and at the right price. This type of organization leaves construction foremen in direct charge of the work, supported by a highly-trained technical organization.

Organization development

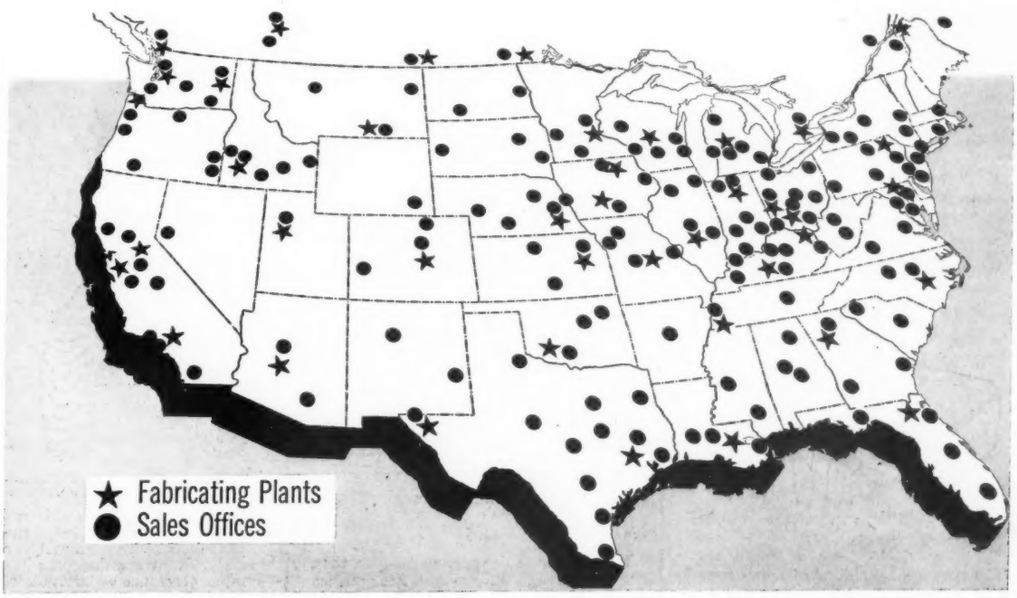
Securing competent foremen for a job is often difficult, but even small contractors can—like large organizations—maintain a list of men who can be called upon on short notice. The prospective project manager or superintendent will find it pays to keep names and permanent addresses of any such men he knows of or has worked with. This personnel file will grow, and become more valuable the longer a person is in the business. After each man's name, note the type of work in which he excels, since a good foreman for heavy construction work might be useless on a swiftly moving housing or highway job.

The first things to be analyzed in doing any preliminary planning for a job are the size of the work, the type of work, and the number of men who will be required to complete it on time. If the project involves construction of a chemical plant, tank builders, lead burners, welders, insulators, electricians, and other types of workmen will be needed. If the project is an office building, few of these mechanical crews will be needed.

An approximate but satisfactory method of arriving at the number of workmen needed for a job is to add up the labor allowed for masons, carpenters, fitters, and so forth, as broken down in the estimate. Then divide this total labor by the average hourly rate to get the number of man hours required. This can be converted into man days, and when they are distributed over the progress schedule, they will show the number of men who will be needed for various periods of time.

If the estimate is not available, take 30 per cent of the total cost of the work (estimated budget cost as labor) and get the result by dividing the average hourly rate.

Theoretically, job progress should follow the pattern indicated by the dotted line in figure 2, progress building up gradually, then discharging at



Here's Why You Get The Service You Need on Armco Drainage and Construction Products

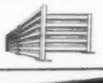
Network of Plants and Sales Offices Offers Products, Data and Assistance, When and Where You Want Them

Wherever you are working, you are close to one of the 50 plants of Armco Drainage & Metal Products, Inc. This means you get the Armco Products you need—when you want them. You can set construction schedules and keep them. Transportation and handling costs are minimized.

In addition, you can get the service and information you need through the strategically located Armco offices or from your nearby Armco man.

Products designed and made for quick, low-cost installation

Armco Drainage and Construction Products are specially designed for fast, efficient installation with a minimum of job-site labor. Check below for a partial list of dependable Armco Products.

Armco Corrugated Metal Drainage Structures	
Armco Steel Pipe Piling	
Armco Tunnel Liner Plates	
Armco Bin-Type Retaining Walls	
Armco Steel Sheeting	

Other Armco Products include Water Control Gates, Beam-Type Guardrail, Corrugated Bridge Plank, Steel Water Pipe, Steel Buildings. Write us for details. Armco Drainage & Metal Products, Inc., 4386 Curtis St., Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO®

For more facts, use Reader-Reply Card opposite page 18 and circle No. 225

the same rate once the peak of work has been reached. Things beyond anyone's control—such as completion of drawings, and delivery of machines—make it impossible to reach this ideal. Such a curve may be forecast from information on promised deliveries of material and equipment. The closer it comes to the ideal, the smoother running and less costly will be the project.

Control charts should be prepared by production and planning, then revised as necessary, so that the employment manager knows just when additional workmen will be required. It will also show the project manager and superintendent when competent foremen must be ready to step into the work. From such information, the project manager can develop the general organization charts and the departmental charts.

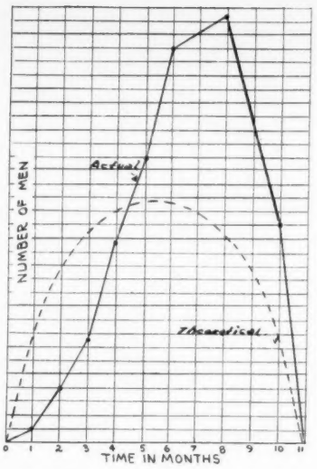


Figure 2.

The nature of the work and the type of contract will determine the extent of the office force needed. This force may be kept at a minimum by large contractors, since engineering, estimating, accounting, and purchasing may all be done at the main office. In other cases—as under cost-plus contracts—all functions may be performed at the field office.

Production and planning

This department is somewhat analogous to the production department in manufacturing industries, being responsible for scheduling, routing, dispatching, stores, costs, and other fundamentals of production control. Until recently, such matters were left to supervisors, men already overburdened with work details. The result was that such work was inefficiently handled.

While the organization chart indicates departments, their functions, and lines of authority and contact, written instructions or "Standard Practice Procedures" are needed to cover duties, responsibilities, and authority of individuals. If, for instance, a project manager has to construct, stock, and operate a storeroom for a multimillion dollar project, it will be necessary to design the building, make lists of required stock items, evolve a system of handling the receipt and issuance of stores, maintain a running inventory, provide safe storage for inflammable materials, and keep required supplies and tools on hand. This would take more time than he could profitably devote to it at the start of a project. All details should be worked out beforehand so that the storekeeper using "Standard Practice Procedures" containing the departmental organization chart, a working drawing of the temporary building to be erected, a list of items to be stocked, and copies of all forms needed, will be able to run this storeroom properly.

A natural tendency when creating "Standard Practice Procedures" is to overdo the job. The best way to check oneself is to ask: "Does this have to be done? Can we eliminate or simplify work here?"

Departmental organization

The extent of design engineering performed on the site will depend on circumstances and the type of contract. In some cases, only field engineering will be required, the design and working drawings being prepared at the main office. In other cases, all plans will have to be made at the site under the direction of the project manager. This means the superintendent must be prepared to install and supervise a complete engineering organization covering all work from the design stage to job completion.

This department's work will be concerned with the design, general building plans and sections, structural details of all buildings and foundations; the design of all mechanical equipment, including electrical work and piping; the billing of all materials for the work; general and extra work estimates; blueprints and records; work of field engineers, including layouts, field measurements, installation check, and quantity survey for cost.

All these functions are covered generally in figure 3, an engineering departmental chart. In making up such a chart, it is best to leave space in each rectangle so that names of persons heading the section can be inserted. Charts of this type should be kept up to date, and copies distributed to department personnel and key personnel in the field.

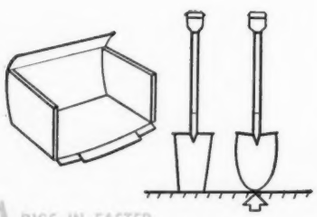
In addition to supervising work in his department, the project engineer should take time for such things as working closely with the job superin-

5 BIG REASONS WHY

ALLIS-CHALMERS SCRAPERS

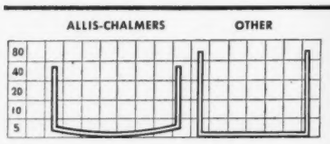
move more dirt at lower cost

Check over these pull scraper features point by point. See for yourself how performance makes dollars when design makes sense.



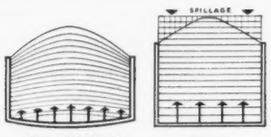
1 DIGS IN FASTER

The penetrating ability of a round-end spade helps illustrate how the curved and offset cutting edge on Allis-Chalmers scrapers concentrates all the tractor horsepower on the center section during initial penetration.



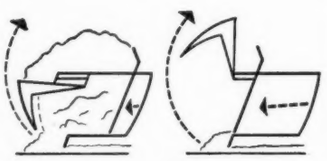
2 LESS LOADING RESISTANCE

Low, wide bowl plays an important part in ease of loading. Since loading resistance is largely determined by the height to which the load is built, the lower, wider bowl of an Allis-Chalmers scraper requires less time and power to get the same yardage as other scrapers.



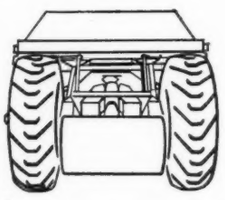
3 HEAPS AUTOMATICALLY

The combination of slightly deeper center cut and correctly angled cutting edge shapes the load as the scraper fills. The greater volume of dirt flowing into the center of the curved bowl "boils" forward, to the rear and to the sides, pulverizing the dirt, filling the voids and producing an automatically heaped load without excessive spillage.



4 POSITIVE EJECTION ASSURES EVEN SPREADING

With patented linkage, apron lifts, then moves forward and up as ejector pushes forward. High apron lift prevents any possibility of material's jamming. Anything that can be put into the bowl can be easily ejected.



5 HAULS, MANEUVERS EASILY

The extra wide, low bowl keeps center of gravity low, helps the scraper hug the ground for safety. Front running gear has ample clearance at all points. The two-to-three feet shorter wheel base permits easier maneuvering. Scraper can turn in its own length.

THIS ALLIS-CHALMERS MODEL 315 SCRAPER has a struck capacity of 15 cu yd (20 cu yd heaped) and incorporates all the job-proved advantages found in other Allis-Chalmers scrapers, 4.7 to 20 cu yd heaped capacities.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 226

tendent, attending all conferences with owner or representative, and attending weekly staff meetings, and subcontractors' meetings. He reports directly to the project manager.

The chief draftsman will have complete charge of design of structures and mechanical installations, though there will be differences in the amount of his responsibility on different jobs. Billing of materials, estimating, blueprint room, and field engineering will be handled by their respective heads, who report to the project engineer and cooperate functionally with the chief draftsman. This setup is based on the supposition that all engineering, billing and estimating will be done at the site.

The total personnel required for the department depends again on the size and complexity of the work and on the job schedule. If past experience shows that engineering and affiliated work costs 6 per cent of the total cost of the job, then on a $5 million estimated cost, this department should operate on $300,000. Of this, $50,000 may be allocated for temporary buildings, light, heat, etc.

If ten months are needed to do the work, engineering should be complete in the drawing room two months before the end of the project. At this rate, $250,000 will have to be spent over a period of eight months, or $31,250 per month if the work is spread out evenly over this period. But since a maximum force cannot be employed from the start of work, the monthly payroll for the department may show a curve, reaching a peak of $40,000 at the height of work. With the average pay rate $400 per month, an engineering force of 100 men can be employed at this period.

Where it is not necessary to cover design work in the field, the bulk of engineering, billing of materials, and similar work can be done at the main office and only a skeleton force maintained in the field. Such an organization is charted in figure 4. In this

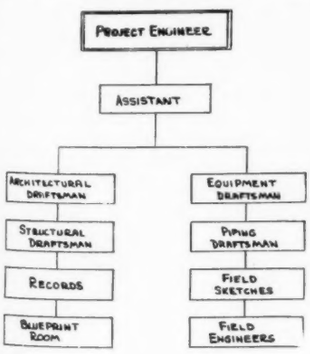


Figure 4.

case, the field engineering layout staff becomes part of the general engineering department organization under the office engineer, reporting to the general superintendent. Sometimes, it might be advisable to have the chief field engineer report directly to the project manager or general superintendent.

Planning and production

A production and planning department, charted in figure 5, is used primarily on larger work where the project manager cannot handle the multitude of work details. On smaller jobs, functions of this department may be absorbed by the regular staff. Much of this department can be adapted to fit into any project, regardless of size.

Mainly, the department is responsible for maintaining a steady flow of work on all parts of the project, relieving field supervisory forces of duties other than those of handling labor and getting the work done. The department has four main subdivisions:

1. The standards and methods section develops routine procedures; takes care of stores; makes surveys for cost records and reports; reports daily and weekly progress on the job;

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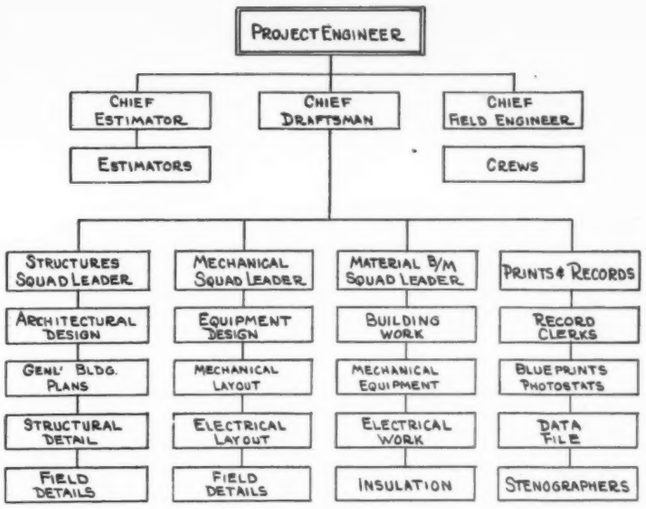
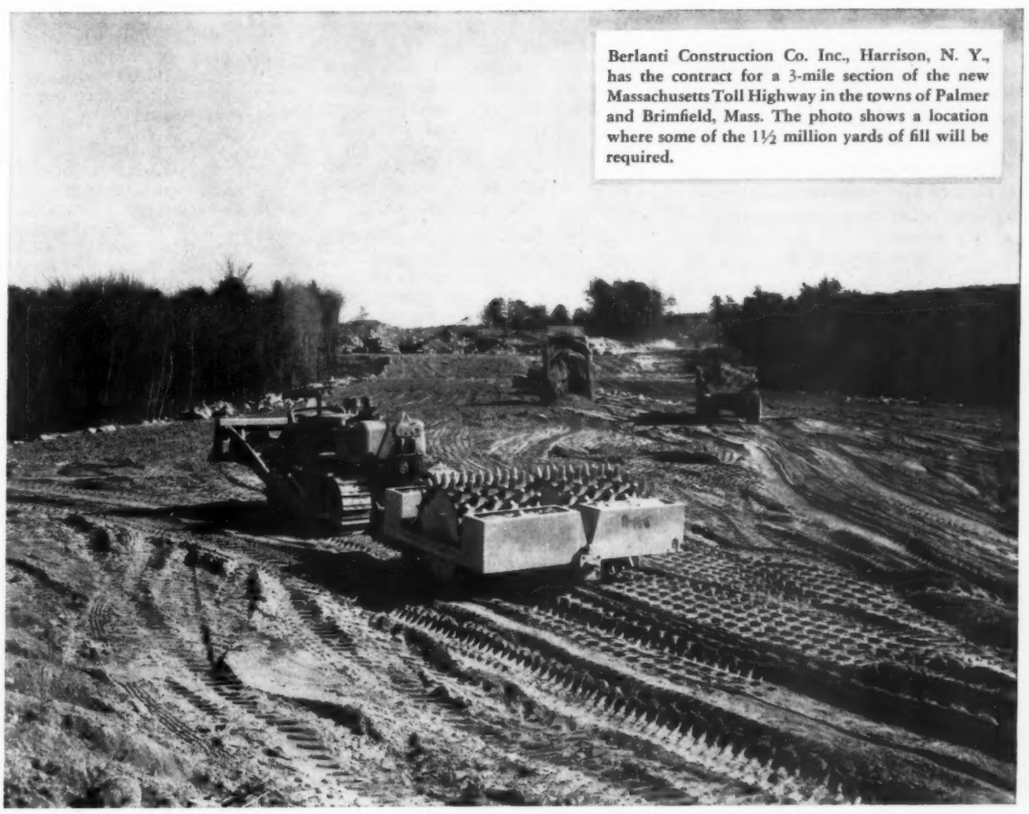


Figure 3.

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Massachusetts Toll Highway Project



Berlanti Construction Co. Inc., Harrison, N. Y., has the contract for a 3-mile section of the new Massachusetts Toll Highway in the towns of Palmer and Brimfield, Mass. The photo shows a location where some of the 1½ million yards of fill will be required.

LIKE other leading contractors, Berlanti Construction Co. Inc., is mighty careful about controllable costs, particularly maintenance expense.

And that's an important reason why the Berlanti people select Gulf as their supplier of petroleum products on every job. They have found that Gulf quality lubricants keep their maintenance costs at rock bottom levels . . . and they appreciate Gulf's prompt delivery service and helpful petroleum engineering counsel.

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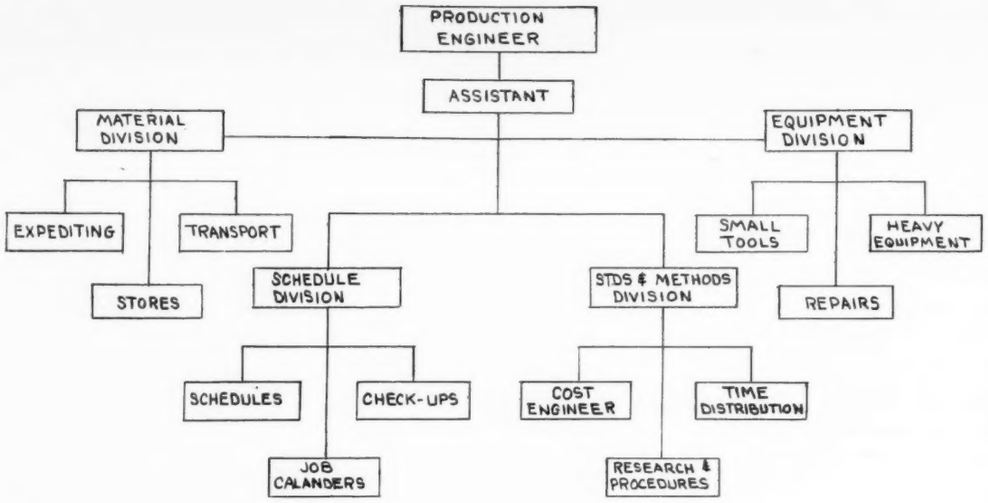


◄ **Figure 5.**

mon to all types of work can be organized departmentally on any type of job. After using estimate figures to determine the men needed from each craft, it is easy to project this information onto charts, allowing a maximum of 20 to 25 men for each foreman, and from 250 to 400 men for each general foreman or section superintendent, depending on the kind of work being done and the speed of operation. Such organization may be done for machine shops, welding crews, tank builders, electricians, and any other groups engaged in craft work. These should be charted also, and their number and classification set forth in the general organization chart. As with other charts, each should have a space for names of key

management

(Continued from preceding page)

and makes cost reports, summaries, and work simplification analyses.

2. The scheduling section makes investigations, reports and schedules to coordinate departmental and field work. This includes time schedules, material and equipment arrival schedules, the schedules of material from delivery to erection, job check-ups, and job calendars.

3. The materials section handles materials, control, transportation, and inventories.

4. The tool and equipment section handles all tool rooms, and dispatches and may maintain equipment.

Other departments

As with other departments, the size of purchasing will depend on the size of the contract, the job schedule, and whether or not purchasing is centralized at the main office. If purchases are made on the job, the department's work would include only the buying of materials and keeping the necessary files and records. Expediting, handling, and control should remain functions of the production department.

On jobs of ordinary size, the office manager or chief clerk will be able to handle all the work in the clerical department field office. Subdivision will become necessary only as jobs get larger. Larger organizations have office manuals which help reduce clerical work to routine, and trained office employees are often maintained as part of a permanent staff to keep operations moving smoothly.

The inspection department, covering inspection of incoming materials, fabricated work, and field installations, is not needed on several types of jobs. Sometimes, the owner will take care of much of the inspection work required.

Relations with labor, problems of welfare, employment, police and fire protection, housing, and sometimes sanitation and safety are handled by the industrial relations department. Sometimes, a separate safety department will be required, headed by an experienced safety engineer.

Certain trade classifications com-

ROADS WORTH THEIR SALT...

Stā-Bilt Salt Stabilization Method Brings All-Weather Road Cost Below $400.00 a Mile

All-Weather gravel roads, vital to farm, school and suburban traffic-feeding, are being built today at a cost often less than $400.00 per mile according to recent surveys among county highway officials. And the fact that these roads often serve through many years with minimum maintenance, speaks well for modern methods of road stabilization.

The principal means of achieving such roads is with the use of Salt, carefully and thoroughly blended and mixed with well-graded road gravel, crushed aggregate or native soils by means of a Seaman-Andwall Pulvi-Mixer. Properly constructed, such a road will last for years under heavy traffic, requiring only an occasional application of calcium chloride solution or light oil. When it is considered that former gravel roads often required eight or nine bladings a year to keep them in shape, the difference in maintenance cost is substantial.

The Seaman-Andwall "Stā-Bilt" method of salt stabilization has many advantages. It mixes the salt to complete depth of the road base, lowering the temperature at which injurious frost action will occur. The salts form a solution which so lubricates the mass as to improve its workability, resulting in better density and water-tightness, with a durable, resistant, glazed surface finish after compacting. All coarse aggregates are securely anchored against raveling, potholing, and dusting.

As its relatively low cost indicates, the Stā-Bilt salt stabilization method is comparatively simple. Stabilizing the subgrade is as important as stabilizing the surface. This should be scarified, if necessary, then brought to proper crown and grade. Then after moistening, the Seaman Pulvi-Mixer pulverizes, mixes and blends the subgrade soil to a depth of 4 to 6 inches or more. This mixing can usually be done for less than one cent a square yard, and is performed with much greater speed and uniformity than the old-fashioned method of multiple passes with a blade. For greater stability this can then be moistened and salt applied with a Century Spreader (1 or 2 pounds per square yard). This is again mixed in full depth, with the Pulvi-Mixer, and compacted with a heavy pneumatic roller.

After again moistening the subgrade, the wearing surface can be spread uniformly, shaped and graded. Then the same procedure followed as with the subgrade — spreading salt (1 to 1½ pounds per square yard) watering generously, then mixing all materials with the Seaman Pulvi-Mixer. Diagram A shows recommended routing of the mixing operation to avoid further reshaping. Usually one mixing will be sufficient if soil is well moistened.

The Seaman Pneumatic Roller is used immediately after mixing. As the surface becomes firm, enough water should be added to leave a free film on top, then rolling should be continued until water disappears, leaving a glossy surface

The final result will be a tough, durable, all-weather gravel road withstanding years of hard traffic with surprisingly little maintenance.

Two methods are currently used to add further life to Salt Stabilized roads. The first is to apply a water solution of calcium chloride two or three times yearly. The second, is application of road oil (SC-3) to the dried surface — about 1/5 gallon per square yard, repeating the application after two weeks.

As time and budget permit, many counties are adding bituminous surfaces to salt stabilized roads for greater permanence.

Spreading salt on Illinois county highway with Seaman-Andwall Century Spreader. Note uniformity of spread.

Final mixing of salt in wearing surface with Seaman Pulvi-Mixer, prior to final compaction. Notice uniformity of mix.

Finished road, Kendall Township, Illinois. Soil-stabilized for many years of traffic with minimum maintenance.

STABILIZING THE WORLD

SEAMAN-ANDWALL CORPORATION

282 NORTH 25th ST., MILWAUKEE, WISCONSIN

CONTRACTORS AND ENGINEERS

men, so that supervisors will know the person to contact on any craft work. Posting telephone extension numbers and radio call letters for each department will also prove invaluable.

Starting work

Usually, superintendents and project managers have to get their organizations together and start work simultaneously. Some of the details requiring their attention are contacting key men for the job, conferring with owners, assembling employment records, arranging travelling expenses for the staff being assembled, securing release letters from employees being transferred from other firm jobs, rechecking on insurance coverage, and arranging for financing. Regarding the latter, it is good practice to open two accounts at the bank, one for payrolls and one for other withdrawals. This will simplify payroll accounting.

At the same time, the superintendent or project manager has to forward to the main office such data as: job mailing address and phone number; local addresses and phone numbers of all key personnel; addresses and phone numbers of doctor and ambulance; and addresses for local and carload freight as well as express shipments.

Then, before the staff is fully assembled, conference reports with owner and engineer should be recorded and copies of any talks sent to interested individuals. If underpinning is required, proper legal steps to notify owners have to be taken early, the law usually holding that they must be given 30 days notice before such work starts. Building permits may have to be secured, and this requires plans and specifications to be filed early so that work will not be delayed. Early application also has to be made for temporary services like water, light, and telephone. Then, to make sure temporary facilities will not interfere with permanent construction, a plot plan of the job site, showing field offices, sheds, and other facilities, should be made. Sanitary arrangements also have to be considered. On larger jobs in out-of-the-way locations, thought has to be given to housing and feeding workmen. Of help in this case will be a copy of the latest recommended structures and practices, which can be obtained from the U. S. Public Health Service in Washington, D. C.

Each job will have different requirements, of course, but a list of all items that have to be taken care of should be set down on a check list so that everything can be handled systematically. Those items not applying to one particular job can merely be checked off the list; details that do apply cannot possibly be overlooked.

(Next month's article will deal with "The engineering department—The organization of quarters, and filing and cost systems.)

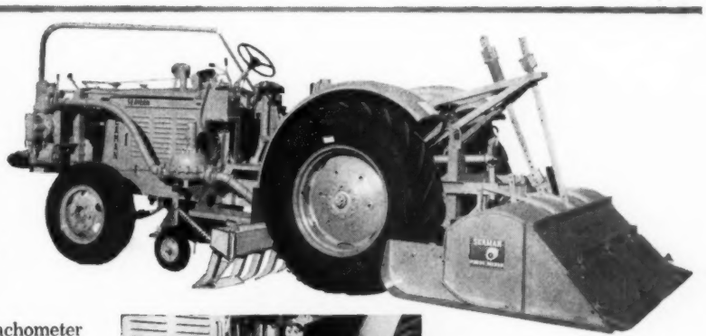
S-A

Complete Stā-Bilt Equipment for Salt Stabilization

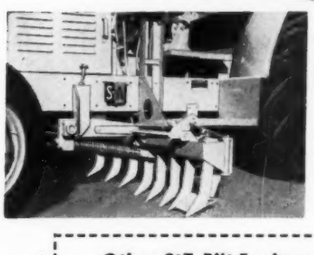
CENTURY "Posi-Feed" SPREADER

Today's leading tailgate spreader, the CENTURY "Posi-Feed" Model HY-4 is equipped with vibratory mechanism in the truck body to maintain steady movement of materials into the spreader. Spreader tray can be replaced with spinner unit for winter use in spreading sand, cinders or salt. One man operation from truck cab — requires no hand feeding.

SEAMAN TRAV-L-PLANT



Today's stabilization "workhorse" the Seaman Trav-L-Plant does a thorough and uniform job of mixing in either new construction or reconstruction. Provides an accurate blend of coarse and fine aggregate for greater load-bearing strength in all types of roads. Equipped with pump, spray bar, tachometer assemblies, and volumetric meter for applying water or bitumen simultaneously with in-place mixing operation. Gasoline or Diesel powered. 7-foot mixing width. Can be equipped with S-A Underbody Scarifier for light scarification.



NEW UNDERBODY SCARIFIER

Can be mounted between front and rear wheels of the Seaman PULVI-MIXER or TRAV-L-PLANT, for light scarification, frequently in the same operation with mixing and binder application. Easily attached, inexpensive.

PNEUMATIC COMPACTOR

Portable, Self-Propelled

Self-Propelled for transport road speeds up to 20 m.p.h. the S-A heavy duty, rubber-tired Compactor is of revolutionary new design. Provides new "straight down" pressure that avoids pushing action, surface shear, scuffing, material displacement. Power Steering — full 180° turn on 20-foot road beds. Four 500-gal. liquid ballast compartments for weight adjustment from 5 to 20 tons. Complete with electric brakes and lights for night transport.

Other Stā-Bilt Equipment Includes:

- Self-Propelled Pulvi-Mixer
- 2-3 Ton Portable Steel Wheel Roller
- HERCULES Cement Spreader
- CENTURY Material Spreaders

Write for FREE Bulletin on Salt Stabilization. Describes advantages, latest techniques and equipment required for building long-lasting, weather-resistant roads at low cost with salt binder.

STABILIZING THE WORLD

S-A SEAMAN-ANDWALL CORPORATION

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Tractors and accessories

■ A booklet which shows and describes the new line of John Deere tractors and equipment has been announced by the manufacturer. Specifications, illustrations, and explanatory text describe the complete line. Accessory equipment for use with John Deere tractors is also discussed.

To obtain this booklet write to John Deere, Moline, Ill., or use the Request Card at page 18. Circle No. 159.

Factory-built conveyors

■ A cartoon-type booklet, "Don't Do It Yourself, or The Adventures of George Gravelworth", is available from Barber-Greene. The booklet points out to contractors the advantages of factory-built conveyors. The cartoons show the problems George Gravelworth ran into when his own shopmade conveyors broke down or became too bulky to be transported. His problems were solved by a Barber-Greene salesman, who ordered a prefabricated conveyor to fit George's exact requirements.

To obtain Booklet DM5601 write to Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 46.

Masonry saws feature fan-cooled motors

■ Fan-cooled totally-enclosed electric motors are now on all Champion masonry saws at no increase in price, according to an announcement from the manufacturer.

Air is drawn in through the end plates and passed externally over the whole surface of the motor. Small fan blades on the rotor serve to circulate the air inside, transferring the heat to the frame and endbells.

For further information write to Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., or use the Request Card at page 18. Circle No. 63.

Champion's fan-cooled motor.

Effect of oversize material, height of face, swing angle, and truck spotting on unit costs are revealed in BPR studies

Make power shovels do more work for less money on highway grading

One of the oldest types of mechanized excavation equipment presently found in everyday use is the power shovel. Though functionally the same today as 40 years ago, many technological improvements have been made in its construction. It has also increased in size, the larger units common to the postwar construction era dwarfing their early predecessors.

Yet, even though it continues to be a principal tool for excavating and loading rock and other materials, there are still many gaps in our technical knowledge of the values of the factors influencing performance.

A power-shovel grading outfit ordinarily has a narrow range in hourly cost of operation, regardless of whether the shovel produces at a high or low rate. The shovel is the primary producer, all production depends on it, and unit costs will generally vary inversely with the quantity produced per hour. Theoretically, a power shovel can operate continuously, yet it is only during short intermittent periods that the average shovel is actually operated in such a manner. The gap existing between theoretical and actual performance can be reduced through improved practices resulting from a better understanding of the nature and magnitude of the factors associated with the operation.

Efficient operation of a shovel-grading outfit is influenced by many factors, the most important being coordination by management, mechanical condition of the machine, skill of the operator, type of material, project terrain, and number and kind of hauling units. Other things being equal, a shovel operator will not attain as high a rate of production in poorly blasted rock as in well blasted rock. Neither will a small shovel produce as much as a large shovel, nor will a great swing angle result in as many completed cycles as a small angle. The objective of this report is to supplement presently available information relating to entire job performances with detailed measurements showing the effect of certain job practices and conditions on two basic variables in shovel production —dipper cycle time and cubic yards.

Performance studies

The performance of 46 power shovels on 33 highway-grading projects has been analyzed with the objective of furnishing an indication of over-all time utilization of shovels by

This Good Roads Spreader Team

...CUTS PAVING COSTS IN HALF!

The "Odell" Aggregate and Asphalt Spreader—designed with the contractor in mind, features low initial cost and exceptionally fast operation. Greater capacity—faster spreading, with less man-power, results in savings of over 50% in spreading costs.

The many "Odell" features, including positive one-time spread-depth adjustment and smooth, clean spread pattern, eliminates the need for 5 and 6 man crews . . . results in lower operating costs.

The Good Roads Handy Aggregate Spreader—spreads from powder-fine carpet up to 3-inch depth. It completely eliminates the danger of streaks and spotty spread . . . automatic transmission permits forward and reverse operation without shifting or de-clutching. Micrometer spread depth control eliminates constant re-setting. Once set, it remains constant for the entire job.

For complete details and specifications on the Good Roads spreader team and how it can help cut your paving costs, see your nearest Good Roads distributor, or write to:

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by MORGAN J. KILPATRICK,
Research Division, Production Cost Unit
U. S. BUREAU of Public Roads,
Washington, D. C.

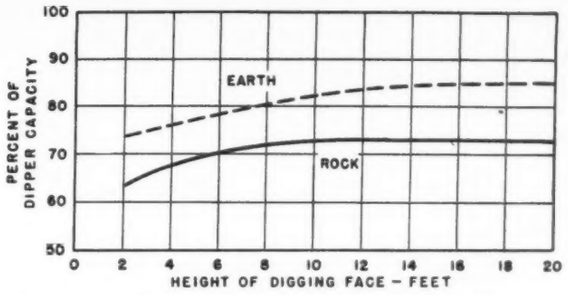

Figure 1. The effect of height of digging face on dipper load, as a per cent of dipper capacity, in earth and rock with no oversize.

contractors and a measure of the influence that some job conditions have on performance. Studies revealing this kind of information have been made by the Bureau of Public Roads over the past 6 years in 19 states. Shovels with dipper capacities ranging from ¾ to 2½ cubic yards were observed, and over 80,000 dipper cycles were timed and evaluated in this analysis.

From these studies it was determined that the time available for loading, swinging, dumping, and returning, is about 54 per cent of the available work time, excluding delays due to weather. The remaining 46 per cent is accounted for in delays of various types. Those in excess of 15 minutes each were classified as major delays and accounted for 16 per cent of the available time. Those of less than 15 minutes each were classified as minor delays and accounted for the remaining 30 per cent of the available time lost in delays.

Major delays were characterized by the preponderant amount of downtime for repairs and maintenance. These alone accounted for 12 per cent of the available working time. In the minor-delay classification, hauling-unit operation and supply delays also accounted for 12 per cent of the available working time. Of the other types of delays, constituting the remaining 22 per cent of available working time, the largest involved moving to maintain a digging position and non-productive operations in the cut.

About half the time lost due to major delays resulted in the job being shut down. The remaining half occurred while a full labor force was available on the job. All minor delays, of course, occurred during periods while a full labor force was available.

The primary purpose of this report, however, is to analyze the 54 per cent of available working time that consists solely of the four dipper-cycle components of the shovel—loading, swinging, dumping, and returning to an approximate original position to commence a new cycle. Occasional moves to maintain a favorable digging position are also necessary. This operation is not ordinarily considered as part of the normal operating cycle but rather an unavoidable delay, the duration of which usually varies with the height of digging face and width of excavation.

Under good field conditions shovel

(*Continued on next page*)

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model D

THE LOW-COST MOTOR GRADER THAT OFFERS
more of everything...

more PRODUCTION-BOOSTING FEATURES

Choice of Allis-Chalmers engines

GASOLINE — 50 brake hp. Bare grader weight —8,800 lb. Four forward speeds to 25.6 mph, one reverse to 3.3 mph.

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ROLL-AWAY moldboard rolls the load instead of pushing it, moves more dirt, uses less power.

Plus one-piece tubular frame, tandem drive, real operator comfort, hydraulic blade lift.

USEFUL OPTIONAL FEATURES

Power circle turn for faster, easier, better control of blade . . . turns 135 degrees.

Leaning front wheels with heavy-duty axle, for better control in close quarter-work.

Hydraulically shiftable moldboard to speed work around obstructions. Shifts 16 in. each way.

Special large tires for added traction, long wear. Front (7.50-20 or 8.25-20) and rear (8.25-20).

more JOB-MULTIPLYING ATTACHMENTS

Hydraulic scarifier, mounted amidships for maximum effective ground pressure.

Shoulder maintainer for safe, one-pass operation. Also available: one-pass windrow eliminator.

Rear-mounted ⅝-yd loader for fast, low-cost handling of materials.

plus snowplows, completely enclosed standup cab, hydraulically operated mower.

more SATISFIED USERS

Since its introduction in 1949, thousands of satisfied owners have *proved* the usefulness and low-cost versatility of the Model D on all kinds of construction and maintenance.

Call your Allis-Chalmers Construction Machinery Dealer for a demonstration today!

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(*Continued from preceding page*)

operators have quite often completed an operating cycle in 0.30 minute when the swing angle is 90 degree or less. This allows approximately 0.10 minute for loading, 0.08 minute for swinging, 0.03 minute for dumping, and 0.09 minute for returning. The individual time elements of such a cycle are small, but by a slight increase in loading time, a pause before beginning the swing, or failure to utilize the engine surge on completion of loading, a greater than necessary swing angle, or a slight hesitation in spotting the dipper over the hauling unit, the production rate will be materially reduced. An increase in the cycle time of 0.03 minute, for example, other factors being equal, will decrease the productive rate of the shovel by approximately 10 per cent. Most extensions or delays of this type are so small that they can be detected only through stop-watch observations. There are others which are much more obvious, however, such as those caused by excessively large rock or poor positioning of the hauling units.

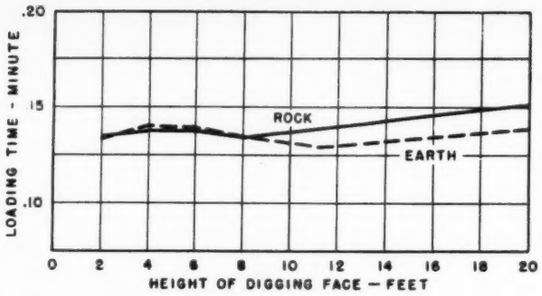

Figure 2. The effect of the height of digging face on loading time of all dippers in earth and rock material with no oversize.

During these studies, detailed records were kept of the volume of material excavated, the number of dipper loads, heights of the working face, and other factors. One of the more difficult problems was the development of an easily identified classification for materials which would reflect significant differences in performance attributable to the material itself. In the final analysis, only two general types were summarized: (1) rock, which was any excavation containing more than 70 per cent field stone, loose or solid rock by in-place volume; and (2) all other excavation, which is identified as earth. Each of the two types was further subdivided into five classifications representing 0, 5, 10, 15, and 20 or more per cent of the material not readily passing through the dipper.

Dipper loads

One dipper pass through material being excavated is ordinarily sufficient to obtain a dipper load. In about 15 per cent of the dipper loads studied, the operator made more than one pass to obtain a satisfactory load. It was determined that a lower height of digging face was one of the factors contributing to extra passes.

Second and even third passes are justified if enough additional material is added to that already loaded in the dipper during the first pass. The greater the per cent of loading time in the total cycle time, the less desirable it is to make additional passes.

The amount of material excavated with each individual dipper was not measured, but an average was computed on the basis of all dipper loads obtained at given work sites where quantities were known.

To show the effect of height of digging face on dipper loads, as a per cent of dipper capacity, material containing no oversize was selected for analysis. The results of this analysis for earth and rock are shown in figure 1 on the preceding page.

Although there is a definite indication of larger dipper loads from higher faces, sufficient variation existed in original data to show that reasonably good loads are frequently obtained from shallow working faces.

Loading time for each dipper, whether loaded with one or more passes, was also influenced by the height of the face. Figure 2 illustrates this effect for all dippers combined in earth and rock material containing no oversize. This figure shows a slight advantage in favor of earth excavation in digging faces above 8 feet. The combination of this time element with the dipper load values shown in figure 1 permit the calculation of the effect of height of digging face on loading time per cubic yard for a composite shovel in earth and rock with no oversize material. The computed values

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Get new Powermatic Drive, a 6-speed automatic specially built for heavy-duty jobs, for the most flexible and efficient application of engine power! Optional at extra cost in all conventional heavy- and most medium-duty trucks. See your Chevrolet dealer for details on the right model for your job! ... Chevrolet Division of General Motors, Detroit 2, Michigan.

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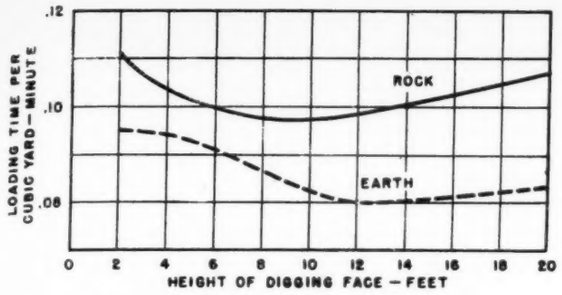


Figure 3. The effect of the height of the digging face on loading time per cubic yard for a composite shovel in earth and rock with no oversize.

are shown in figure 3. Obviously there would be two different curves for each shovel size; however, the relative position of the two curves would not be changed.

Figure 3 shows the optimum height of digging face in rock and earth to be 10 and 13 feet, respectively. Practical aspects of determining a suitable range for deviation from the optimum leads to the conclusion that from 6 to 13 feet in rock and from 10 to 18 feet in earth will produce near optimum values for loading time per cubic yard.

Material containing 5 per cent oversize was frequently encountered during the studies. An analysis was also made to show the effect of height of digging face on loading time per cubic yard in this type of material. The data was plotted and the curves thus developed, though erratic at a few points, had similar characteristics as those shown in figure 3.

The optimum height of digging face was lower, 7 and 9 feet, respectively, in rock and earth. Where the height of face was less than 6 feet, the loading time per cubic yard increased sharply to a maximum at 2 feet. Above the optimum height of face there was a gradual increase in loading time per cubic yard up to 20 feet.

Figure 3 reveals that oversize material was a major factor affecting the load obtained per dipper. Another penalty of excavating oversize material is shown by figure 4, which indicated loading time of a composite shovel in earth and rock for each classification of material.

The effect of oversize material on loading time is more pronounced in the earth classification. Of significance is the large increase in loading time for earth containing 10 per cent oversize or more. It indicates that boulders are a great deterrent to routine operation in earth.

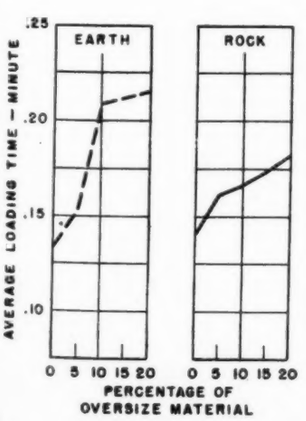


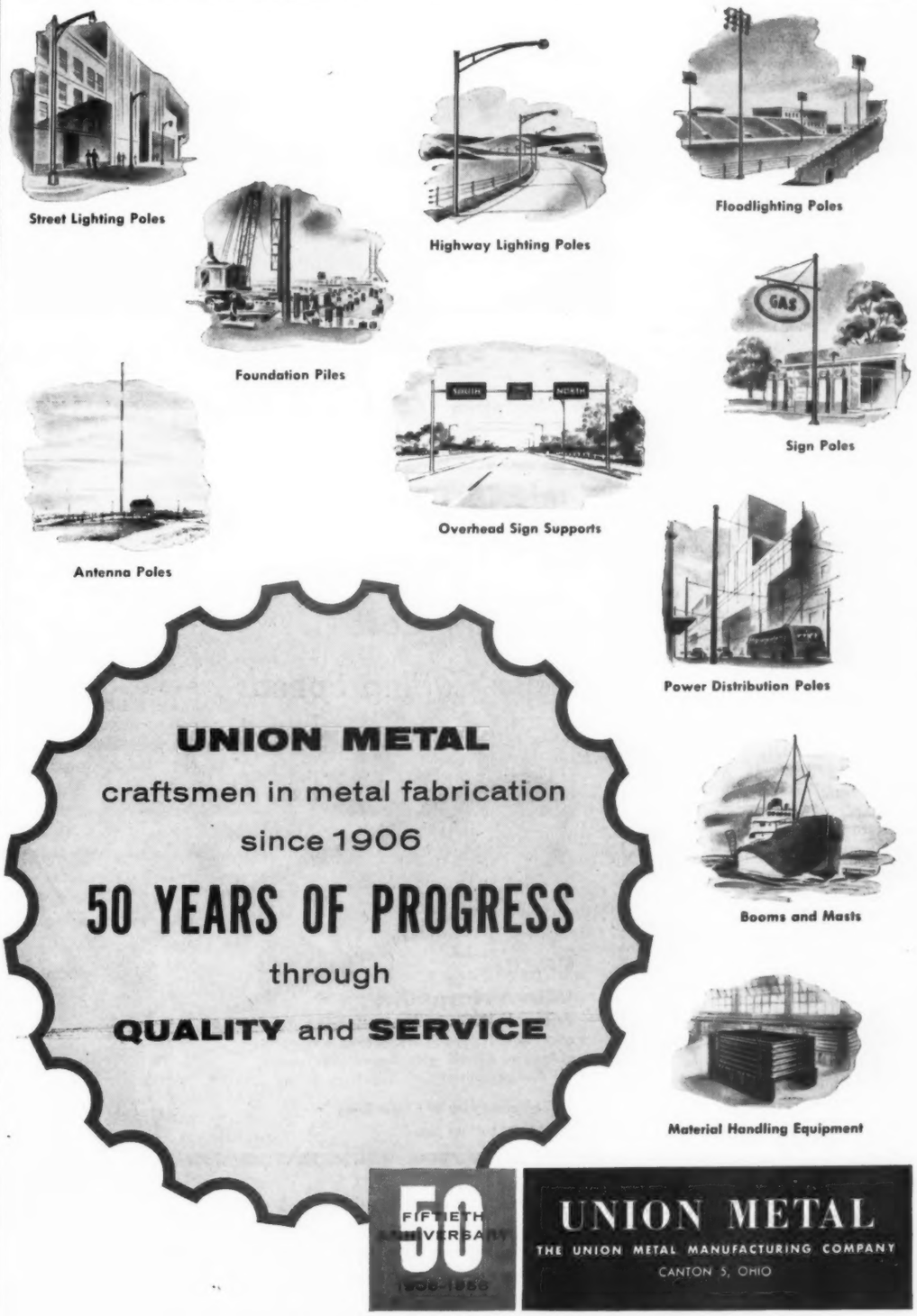
Figure 4. The effect of oversize material on average loading time. The height of the face is 2 to 15 feet.

Swinging the dipper

The second motion of the cycle is swinging and spotting the dipper in a dumping position. Swing and return angles ranging from less than 15 degrees to 225 degrees were encountered. The number observed in excess of 180 degrees was less than one-third of 1 per cent and no attempt has been made to show averages for these excessively large angles. The possibility of a relation between height of digging face, dumping level, and swing time and angle was investigated, but there did not appear to be any positive correlation between these factors. Classification of material was not a factor in swing time.

The average swing angle observed was 79 degrees and ranged from 68 to 83 degree average by size of shovel. A frequency distribution of swing angles for one size of shovel is shown in figure 5.

The two distinct areas over which the swing is made are the digging area and the truck-spotting area outside the digging area. If it is assumed that an average of 45 degrees in the digging area generally reflects an efficient shovel setup, then 34 degrees (79 degrees – 45 degrees) was used for swinging within the truck-spotting area. Efficient operation can generally



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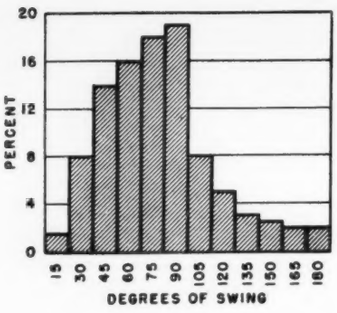

Figure 5. The frequency distribution of swing angles for a 1½-yard shovel.

be achieved with less than a 34 degree swing in the spotting area. The extent to which this amount was actually required on the jobs studied was not determined.

Job problems of height of face and total width of area being excavated have an influence on the average degree of swing. A specific appraisal of these latter functions was not attemped for individual jobs.

Delays due to moving to maintain a good digging position averaged 0.60 minute per occurrence and were noted to happen once every 21 dippers. Thus, the average dipper cycle was in effect increased 0.03 minute due to moving, but doubtlessly this increase fluctuated inversely with changes in depth of width of digging face. It is inevitable that some loss of time will occur due to moving, which, of course, should be accomplished in a manner that permits the greatest total accomplishment.

Factors in dumping

The next element making up the complete cycle is that of dumping. Dropping the material from too great a height may damage the hauling unit, and from dumping too far off center of the unit results in material being wasted over the side of the hauling unit. In very much the same manner as loading, it was observed that dumping was influenced by the amount of oversize material being handled.

Completion of each cycle element in the minimum time is a consideration whenever shovels are used; but regardless of the factors involved, the operation must be considered in total as the cycle time per yard. Within the range studied, cycle time elements are not directly related to the size of the shovels whereas, cubic yards per dipper has been noted to vary with the size for any given type of material.

Oversize material and height of digging face affect both loading time and cubic yards per dipper. Oversize material also affects dumping time. The swing angle influences swing and return time.

Existence of a greater relative percentage of oversize material has still another influence on shovel performance. This will be found in minor delays due to special handling of rock. Figure 6 shows the extent of these delays in time per cycle for the composite shovel.

With large amounts of oversize material present in the excavation, there tends to be greater abuse of the shovel. It would be very difficult to accurately appraise any loss due to this cause. Nevertheless, such abuse might easily result in adding enough to the 20 per cent oversize group to double the cost of excavating that material.

Time lost from excavating material containing oversize is a problem of considerable magnitude that the highway contractor must face if he uses shovels. Increased cycle time due to oversize obviously has an adverse influence on unit cost of shovel operation. Blasting techniques and breakage can be improved in many cases by investing a nominal sum in additional explosives. It can also be improved by hiring qualified assistants to perform the blasting job in the correct manner.

A shallow digging face likewise results in lost time, but this may be a problem outside the limit of the contractor's control. A small swing angle will result in more dipper cycles being completed than if a large swing angle is taken.

There are many opportunities to improve shovel performance. It can be done by reducing or eliminating oversize material, by positioning the

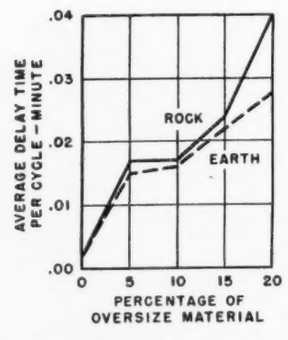

Figure 6. The effect of oversize material on delay time per shovel cycle for special handling of rock.

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AND WITH THE NEW HOMELITE FLOATING POWER, you'll find handling ease you never knew before. The all-angle, any-position carburetor gives you full power cutting — whether you're felling, bucking, notching, limbing or under-cutting.

Floating Power lets you cut with less effort, less fatigue than any other chain saw. Because the Homelite EZ weighs only 19 pounds you can carry it anywhere. Its full 5 horsepower cuts through 8″ Oak in 5 seconds and 18″ Pine in 14 seconds. And the three bar sizes — 17″, 21″ and 25″ will handle trees up to 3 feet in diameter.

The EZ brings you Homelite dependability at a new low cost — not just a low initial cost, but also lower maintenance and operating costs than any other direct-drive chain saw.

See this new floating power now! Try it and you'll know why the Homelite EZ offers easier cutting, faster cutting, more profitable cutting for your dollar.

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shovel to obtain optimum height of face and swing angle in the digging area, and by spotting trucks to permit the minimum swing angle outside the digging area. Shovel owners should carefully appraise their operations in light of decreased unit costs than can result from proper job planning.

THE END

From a paper presented at the Highway Equipment session of the 35th annual meeting of the Highway Research Board, Washington, D. C.

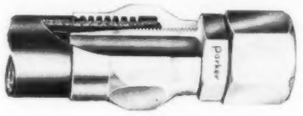
Rubarite names president

Emil R. Albert, Jr., has been appointed president and general manager of Rubarite, Inc., Chicago, Ill., subsidiary of the Goodyear Tire & Rubber Co., Akron, Ohio, The National Lead Co., and Bird & Sons, Inc.

New fitting requires no stripping of cover

■ The Parker Appliance Co. has announced the development of a new "no-skive" type of re-usable fitting. The new fitting consists of socket and nipple, and does not require the hose cover to be stripped off.

The new no-skive Hoze-lok line offers four different connecting ends:



tapered male pipe thread, new straight thread with O-ring sealing, J. I. C. standard Triple-lok 37-degree flare noze for tube connection, and swivel nut for connection with any Triple-lok adapter. The fittings are machined from high-tensile-strength steel barstock. Sizes available are for hose of ¼, ⅜, and ½-inch ID.

The hose being offered has a tough outer cover which is resistant to oil, weather and abrasion. One-wire braid hose is offered for medium pressure use and the two-wire for high pressure. The seamless inner rubber tube is reported to be suitable for service with hydraulic fluids, hot oil, grease, lubricants, crude and fuel oils, gasoline, liquefied petroleum gas, air, or water.

For further information write to Tube & Hose Fitting Division, Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio, or use the Request Card at page 18. Circle No. 116.

Motorized concrete cart with 18-foot capacity

■ A motorized construction cart capable of speeds up to 20 mph and with an 18-cubic-foot concrete capacity is announced by the Dart Mfg. & Sales Co. The Construction Cruiser comes with a detachable blade for ground or blacktop leveling and backfilling.

Featuring an all-steel dump body with hydraulic dump and blade operation, the cart is powered by a Wisconsin 8-hp engine. It has a Borg-Warner differential and transmission, a front-wheel drive, and a Miner automatic double-compensating clutch.

For further information write to Dart Mfg. & Sales Co., 1002 S. Jason St., Denver, Colo., or use the Request Card at page 18. Circle No. 123.

Corrugated-pipe booklet

■ A new bulletin from Armco Drainage & Metal Products, Inc., tells how to achieve a wide variety of end finishes with corrugated metal pipe installations. Among these are end sections; square, beveled, and skewed ends; riprap; sheeting; toewall; drip inlets; cantilevered ends; and spillways.

To obtain Bulletin CMS-12055 write to Product Information Service, Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 160.

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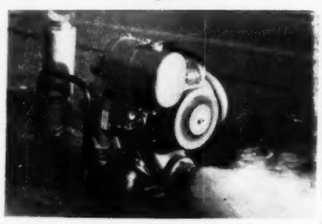

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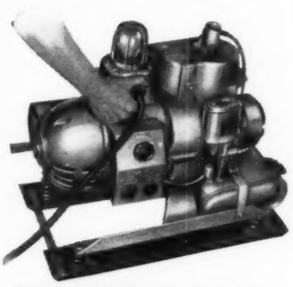

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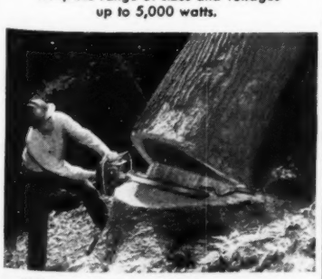

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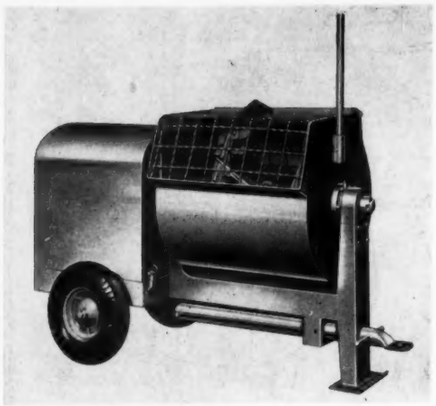


The new Speed King 4-cubic-foot concrete-plaster-mortar mixer.

New line of small tilting-type mixers

■ A new line of small tilting-type concrete-plaster-mortar mixers is being offered by the Speed King Mfg. Co., a division of The Jaeger Machine Co. Both a 4-cubic-foot model and a 6-cubic-foot model feature pugmill-type mixing by four sets of three-blade paddles securely clamped to a square shaft.

Clinton and Briggs & Stratton engines with built-in transmission drive the units through a double V-belt to a jack shaft carried in two pillow block-type antifriction bearings. Final reduction is through a machine-cut pinion and bull gear equipped with safety shear pin. A simple shift lever disengages power merely by loosening the drive belt.

The 4-cubic-foot model has a low loading height of 34 inches and width of 29½ inches. Abrasion-resistant alloy steel drums with safety grill and sack splitter are standard on both models. Rubber wiper blades are optional.

For further information write to Speed King Mfg. Co., 550 W. Spring St., Columbus 16, Ohio, or use the Request Card that is bound in at page 18. Circle No. 8.

New power roller uses hand-operated clutch

■ A new 1½-ton construction and maintenance roller for use on subgrades, hot-mix surfaces, and in other compaction applications is announced by the United Roller Mfg. Co. The Champ 100 has a 6.3-hp engine capable of speeds up to 4½ mph.

The machine's clutch is operated by a hand lever—a feature said to permit easy and instant change of direction. The front roll is 24 inches in diameter and 24 inches long, while the rear roll has a 26-inch diameter and a length of 31 inches. The machine is 85 inches long and 36 inches wide, with a ground clearance of 7½ inches.

The Champ 100 weighs 2,000 pounds empty and 3,000 pounds filled. The sprinkler system has a capacity of 21 gallons. Cocoa matts for the sprinkler system and scraper bars are available.

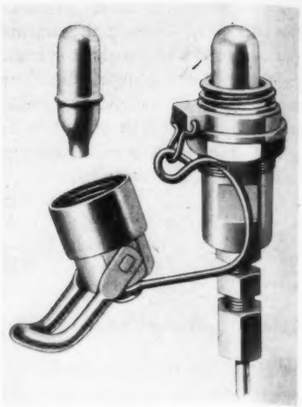
For further information write to United Roller Mfg. Co., Inc., 1333 Main St. E., Rochester 9, N. Y., or use the Request Card at page 18. Circle No. 91.

Improved system aids cold-weather starting

■ Quick, easy starting on cold mornings is claimed with the improved direct electric starting system announced by Caterpillar as attachments for D6, D4, and D2 tractors, and No. 977, No. 955, and No. 933 Traxcavators.

Each of the 24-volt systems now includes as standard equipment two ether starting aids and the necessary tubing to inject vaporized ether into the air-intake manifold. The use of the ether starting aids in conjunction with the commonly used glow plugs is said to make it possible to start without difficulty in temperatures as low as 10 degrees F.

For further information write to the Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 138.



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Fruehauf's Complete 1956 Line Of High-Efficiency Construction Units Includes:

Hopper and Hoist-Type Dump Trailers

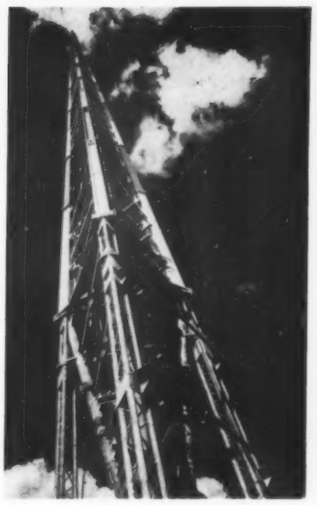
Removable and Stationary Gooseneck Carryalls

Portable electric plants

■ How lightweight, portable Onan electric generating plants may save time and money for contractors is described and illustrated in a new folder from the manufacturer. The brochure pictures the entire new line of air-cooled portable electric generating plants. Single-cylinder models from 500 to 2,500 watts are fully described and the new Onan two-cylinder, high-capacity generating plants in sizes of 3,500, 5,000 and 10,000 watts are shown and discussed.

To obtain Form A-406 write to D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis 14, Minn., or use the Request Card that is bound in at page 18 of this issue. Circle No. 158.

APPROXIMATELY 50 TONS of galvanized Anco structural rib bolts and lock nuts were used in erecting what is reported to be the tallest structure of any kind in the world, the new TV tower for Station WKTV in Oklahoma City, Okla. The bolts and lock nuts are manufactured by Automatic Nut Co., Inc. The tower weighs more than 660 tons and rises 1,572 feet above the ground, exceeding the height of the Empire State Building by 100 feet. Triangular in shape, the structure is 12 feet wide on each of its sides up to the 1,420-foot level. From there, it tapers to the base of the TV antenna. For further information, write to **Automatic Nut Co., Inc.**, Lebanon, Pa., or use the Request Card at page 18. Circle No. 168.



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EATER EFFICIENCY in load distribution and standing versatility are the big features of this ehauf utility platform. Outside stake pockets vide quick conversion to stake and rack uses. rt radius corners permit more loadable length extra hauling profits. Positive, equalized action of the tandem assembly keeps the weight of the load distributed on all four wheels. Designed to allow the wheels to go up and over bumps with little effect on the level of the Trailer, this tandem produces a smoother, more shock-free ride. Single or tandem axle models, in all lengths.

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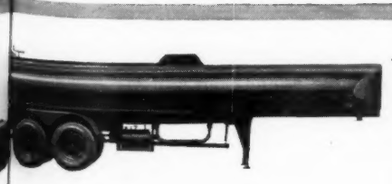
Up To 125 Barrel Capacity • Discharge Rate 10 To 15 Barrels Per Minute

THE HIGH-CAPACTY Fruehauf Bulk Cement Transport features high-speed engine-driven blowers for rapid unloading and fast movement of materials. With this simple air-slide method of discharge, no mechanical device comes in contact with the load—unit hauls longer at reduced operating costs. Adaptable to the transport of most pulverized materials, it is available in semi or full Trailer units for use singly or in combination, as shown at left.



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Furred-metal ceilings

■ Furred-metal lath ceilings—consisting of an assembly wherein the metal lath is attached to steel channels, rods, or wood furring strips which are in direct contact with the construction above—is the topic of a bulletin from the Metal Lath Manufacturers Association. The erection of furring and metal lath is described. Diagrams show how the ceilings are fastened to the underside of steel, concrete, and wood joists.

To obtain Bulletin No. 16 write to the Metal Lath Manufacturers Association, 636 Engineers Bldg., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 72.

Line of tire chains has self-cleaning cross-links

■ Hand-made cross chains fabricated over open fires and shorter-than-standard-length side chains for extra strength are features of the heavy-duty traction chains for earthmoving equipment manufactured by the Valk Mfg. Co.

The Hi-Link cross chain is said to be self-cleaning and is made from ⅝-inch abrasive-resisting steel with high magnesium content. The Shur-Grip side chains are made from ½-inch-round carbon steel.

Side and cross chains are connected by means of specially-designed heavy-duty locks.

For further information write to the Valk Mfg. Co., Carlisle, Pa., or use the Request Card at page 18. Circle No. 121.

Valk heavy-duty traction chains for heavy earthmoving equipment have extra-strength cross and side chains.

The new Pettibone Wood Speed Mixer.

New road-mix machine combines many features

■ The Pettibone Wood Speed Mixer, a new road-mix machine has all the features needed for pulverizing, blending, and material processing for base stabilization.

The Speed Mixer applies bituminous or other binders through a spraybar just ahead of the rotor. It is equipped with the necessary power controls, all easily accesible to the operator.

Binders are pumped from supply tanks and injected into the material through an adjustable high-pressure bypass metering system on the Speed Mixer.

A heavy-duty rotor, chain-driven from both ends, produces power. The rotor blades are uniformly spaced across the full width of the shaft.

For further information write to the Pettibone Wood Mfg. Co., Box 620, 6900 Tujunga Ave., North Hollywood, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 137.

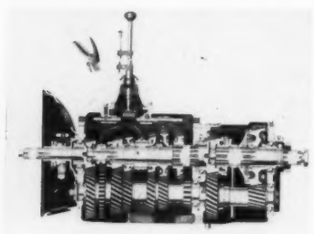
New truck transmissions

■ The Fuller Mfg. Co. has announced two new semiautomatic Road-Ranger transmissions with 10 forward and 2 reverse speeds. The new units are the Models R-96 and R-960.

The new models are 2½ inches shorter and 60 pounds lighter in weight than the units of the preceding R-95 series. By replacing only 5 parts, the new R-96 can be converted into the overdrive model, a feature not found in the Series R-95.

Advantages claimed for the R-96 and R-960 by the manufacturer include easier quicker shifts, higher average road speeds, less driver fatigue, greater compactness than other 10-speed transmissions, and weight distribution that permits more cargo to be carried on the payload axles.

For further information write to the Fuller Mfg. Co., Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 135.



The new Model R-96 Road-Ranger transmission made by the Fuller Mfg. Co., Kalamazoo, Mich.

Railway crane

■ Action shots in a new catalog show the Koehring RailAid loading and unloading itself on a ramp-equipped car, and setting the car on or off the track to clear the rails for normal traffic. Able to move through work areas at speeds up to 20 mph, the unit can dig, lift, lay rails, and handle materials anywhere along the line. Included in this catalog are illustrations of other products of the firm that may be used in railroad work: crawler and rubber-mounted excavators, the Mud-Jack, a 6-cubic-yard-capacity Dumptor hauling unit, the Moto-Bug power wheelbarrow, bituminous mixers, trenching equipment, and clamshell buckets.

To obtain this catalog write to Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card that is bound in at page 18. Circle No. 69.

Low-cost steel grating reinforces, saves floor

■ Floors and other areas which are subject to a great deal of abuse and heavy traffic reportedly can be made much more durable with Gridsteel, a low-cost floor armor developed by the

Here's the New

R-15 "Euc

that sets a new high in 15-ton Rear-Dump Performance

DUMPS FAST AND CLEAN

Smooth body interior and tapered rear chute assures clean shedding of the load well back of the rear wheels—an important feature for dumping into hoppers or over the edge of waste banks. Lycoming Silica Sand Co. in Pennsylvania has used 15-ton "Eucs" for years and now has added two R-15 Rear-Dumps to their hauling fleet.

STAY ON THE JOB LONGER

Victorville Lime Rock Co. in California uses 2 Model R-15 "Eucs" for hauling rock and overburden. Rugged body and frame withstand the impacts of loading, hauling and dumping heavy excavation in construction, mine and quarry service.

Built for heavy off-the-highway service, 15-to Rear-Dump "Eucs" have paced the field for ove 20 years. They've reduced hauling costs on hun dreds of the toughest jobs in mine, quarry an construction work . . . delivered "plus" performanc year in and year out.

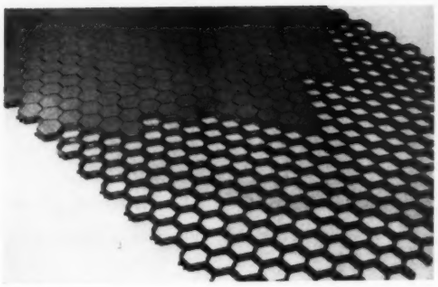
This model R-15 incorporates the engineering ad vances, the easy operation and maintenanc features, resulting from unequalled field expe ience with other Euclid Rear-Dumps of the sam capacity. It provides the dependable work-abili that means more payloads per day at lowest co per ton or yard moved.

Have your Euclid dealer give you full details o this new 15-ton Rear-Dump and the complete lin of Euclid earth moving equipment. He'll be glo to show you why so many users have proved fo themselves that *Euclids are your best investment*

BOXES 1246-1247 & 1312-1313

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

The R-15 is your BEST BET for Lower Hauling Costs!



Irving Gridsteel floor armor, partially filled with concrete

Irving Subway Grating Co., Inc.

Gridsteel is made of steel bars on edge, fastened together in an over-all hexagonal pattern. This steel flooring may be placed over any type of floor surface or incorporated with new flooring in new buildings. After the Gridsteel has been laid, its meshes are usually filled with concrete or some type of mastic.

The steel bars of the Gridsteel are said to take all the heavy wear to which the floor surface may be subjected. According to the manufacturer, the concrete fill cannot develop dangerous ruts or potholes because any cracking or chipping is confined to the small area of a single mesh in which it might occur. Floors or floor areas armored with Gridsteel are said to last indefinitely and to require no major repairs.

Gridsteel is usually supplied in a bar thickness of 14-gage steel by ¾-inch depth, but is available in other gages and depths where desired. It is shipped to the job in standard 3×10-foot panels which can be quickly spliced together to form a continuous armored floor surface.

For further information write to the Irving Subway Grating Co., Inc., 5056 27th St., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 34.

Booklet on precast slabs

■ Detail drawings and design data are provided in a booklet on the Flexicore precast concrete system. Simplified erection, job savings, and specifications are explained, and pictures of installations are included.

To obtain this booklet write to the Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 161.

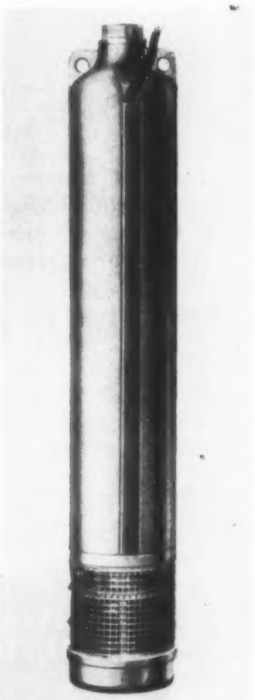
Submersible sump pump

■ The Pleuger sump and waste pump, a new submersible pump, can pump down to a water level of 4 inches because its water intake is located at the bottom of the unit.

The Pleuger pump, Type LB72, is powered by a water-filled and water-lubricated motor located above the pump for protection against dirt and sand infiltration. Water is drawn directly into the first stage of the pump, bypassing the water-lubricated motor, and is delivered through a 2½ inch hose connection on the discharge outlet.

The new pump is 8 inches in diameter and weighs from 130 to 175 pounds, depending on the model. It is offered with 5, 10 and 15 hp, with capacities up to 300 gpm and heads to 140 feet.

For further information write to Pleuger Submersible Pumps, Inc., Lancaster, Pa., or use the Request Card at page 18. Circle No. 150.



The new Pleuger submersible sump and waste pump.

←For more facts, circle No. 237

Advanced design results from 20 years of leadership in building off-highway Rear-Dumps

Some of the OUTSTANDING FEATURES of the R-15

- 10½ yd. body 30,000 lb. payload
- 218 h. p.
- loaded top speed of 25 m.p.h.
- hydraulic booster steering
- air assist clutch
- free floating springs
- 14.00 x 24 drive tires (16.00 x 25 optional)

POSITIVE CONTROL OF DUMPING

ouble-acting 3 stage Euclid hoist and hydraulic stem gives the operator fast, positive control of e body position at all times. Dumping angle of the dy, in fully raised position, is 68°. Body, frame d hoist are designed and built as an integral unit. cDowell & McDowell are using six R-15 "Eucs" to ul heavy excavation at a big plant site job in shville, Tennessee.

SPEED AND STABILITY

The 5 speed transmission and Euclid planetary axle provide a top speed of 25 m.p.h. with full 15 ton payload . . . 27 m.p.h. with 16.00 x 25 tires. Free floating Euclid spring suspension gives maximum stability empty or loaded under all road conditions . . . permits faster safe travel speeds. Dale Bloom had a fleet of 6 Rear-Dump "Eucs" on this Kansas Turnpike job—2 of them the Model R-15.

EASY OPERATION

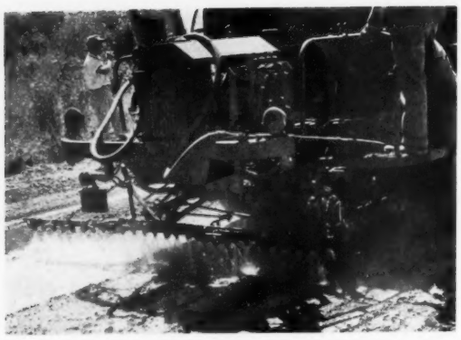
Full width cab offset to left for maximum vision, air assist clutch, booster steering, 218 h.p. engine, fast acting hoist, free floating springs and fully adjustable seat contribute to driver comfort and easy operation. Four of these new Rear-Dumps worked on a highway relocation job of W. J. Menefee Construction in Missouri.

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

BOXES 1246-1247 & 1312-1313

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



Chemical cuts soil stabilizat[ion cost]

The agent, simply applied, gives subgrades high strength; capillary action is lowered in treated soils

Mixing readily with water, Arquad 2HT is sprayed onto the subgrade, along with water for compaction, by an Etnyre 1,000-gallon distributor. The soil, already pulverized to a 6-inch depth, will be repulverized to insure uniform distribution of the additive.

At a time when local, state, and federal agencies, together with road-building contractors, are searching for more economical methods of constructing roadways, announcement has been made of the development of a new soil-stabilizing agent that is calculated to lop four-fifths off the present cost of stabilizing a mile of subgrade.

Called Arquad 2HT, the soil-treating chemical is a quaternary ammonium salt (dioctadecyl dimethyl ammonium chloride) made from tallow. It was developed as a soil-stabilizing agent by the Union Starch & Refining Co. with the cooperation of the chemical division of Armour & Co., Chicago, Ill.

The first use of the chemical was made on two sections of highway being reconstructed by the Indiana State Highway Commission after laboratory tests showed that Arquad 2HT was ready for field testing. Results show that treated soils, while almost without capillary action, have a high compressive strength.

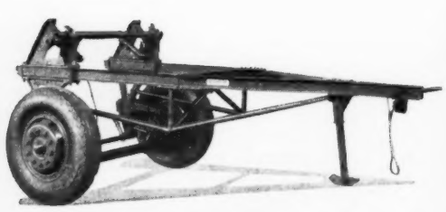
Applied by distributor

The first test strip, 400 feet long and 22 feet wide, was on Route 42, about 2½ miles southwest of Cloverdale, Ind. The subgrade in this area, having a high clay content, is classified as "B" and "C" Horizon type. The quaternary was added to the raw soil to a depth of 6 inches, and the strip was surfaced with 1 inch of hot-mix. A control strip consisted of 5 inches of stone aggregate, topped with an inch of bituminous concrete.

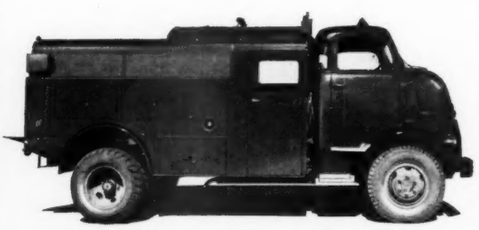
Arquad, which disperses easily in water, was added to water in an Entyre 1,000-gallon distributor, which wet the subgrade ahead of rolling equipment. The soil was pulverized to a depth of 6 inches, and one part of Arquad was sprayed onto the grade per 1,000 parts of the dry weight of the soil. The treated soil was then repulverized in place to distribute the additive uniformly.

Even the use of trace amounts of Arquad 2HT improved the wetting properties of the water used for compaction, and permitted a uniform wetting of clay clods.

A similar procedure was followed at the second site on Route 243 south of Putnamville, Ind., where two test strips and a control strip were constructed. This area has a predominantly silty soil that is not very cohesive. The first strip, 250 feet long, was shot with Arquad 2HT to a depth of 6 inches, and the second strip was treated with the chemical to a 3-inch depth, then topped with 2 inches of



PWD-2 Cable Reel Trailer



MW-128 Utility Truck Body

HIGHWAY the most-used line in line construction and maintenance

IU-76 Installer's Unit

HC Earth Boring Machine

By building the tools that best fit the job, Highway has become America's major supplier of telephone and power line construction and maintenance equipment. All this equipment is Highway-designed and Highway-built in our own shops, assuring long service life at low operating cost.

Tell us your needs or requirements in service equipment. Let us show you how our design, engineering, and stepped-up production facilities can solve your toughest problems.

Highway PWD-2 Cable Reel Trailer is designed for quick, easy loading and transport of heavy cable reels up to 48" wide. Like other Highway utility trailers, it handles its unwieldy load safely and steadily, even at high speeds on the road.

Highway MW-128 Utility Truck Body carries a full crew to the job with all necessary materials and equipment on a standard truck chassis. Highway builds a full line of utility bodies for general and special service.

Highway IU-76 Installer's Unit is a specialized body for mounting on a half-ton truck. Scientifically arranged equipment compartments and tool carriers at sides and rear put all needed tools and materials within arm's reach.

Highway heavy-duty HC Earth Boring Machine digs holes 9 to 30 inches in diameter, 7 to 10 feet deep at any angle in any soil except solid rock. Portable, tractor-mounted, and self-powered models are also available.

HIGHWAY TRAILERS

Sales and Service in Principal Cities

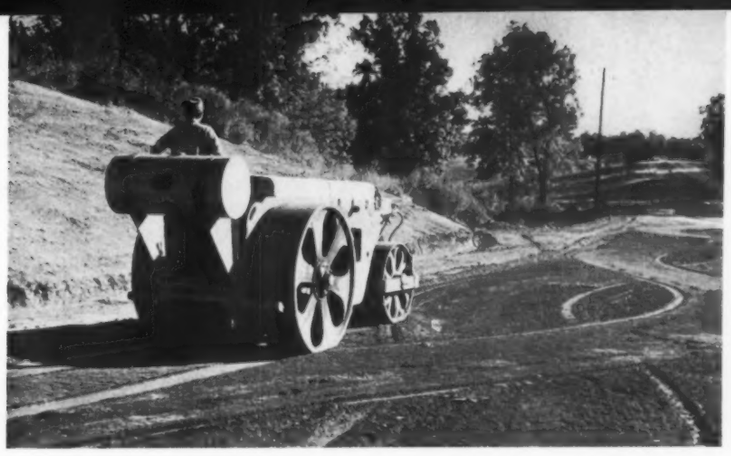
HIGHWAY TRAILER COMPANY
HEADQUARTERS: EDGERTON, WIS.

MANUFACTURERS OF

Utility Truck Bodies • Earth Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-Offs • Service Accessories • Commercial Trailers and Trailerized Tanks

For more facts, use Reader-Reply Card opposite page 18 and circle No. 238

...sts on highway subgrade tests



A Huber roller compacts the subgrade after the soil has been treated with Arquad.

aggregate. These two strips were surfaced with an inch of hot-mix—an amount deemed sufficient to seal out suface water and prevent the strips from being damaged by traffic, but insufficient to add to the structural strength of the pavement. The control strip consisted of a 1-inch surfacing of hot-mix on raw soil.

This minimum amount of surfacing on all test and control strips was done, since the pavements were designed to show the relative strengths of the subgrade material in all sections.

An unsurfaced but treated subgrade in one section, exposed to traffic and weather for three months, showed a high degree of resistance to surface water and abrasion.

The materials cost of using Arquad 2HT for a mile of subgrade stabilization is set about one-fifth the present cost. But this saving represents only a beginning on total savings. Since the quaternary can be simply applied, and since suitable aggregates for soil stabilization—already scarce in many areas—are expensive to ship, the chemical may enable soil-stabilization to be done for an even smaller fraction of the cost of current methods.

The test job on the Indiana roads, marking an important new development in road work, also opens a new field of exploration for other contractors, who may find the chemical suited for use in backfilling for structures, in reducing capillary action in irrigation ditches, and in waterproofing highway shoulders. THE END

Offer new line of forms for round-column pours

■ A new line of fiber tube forms for pouring round columns is now being furnished by the Richkraft Co., Chicago, Ill. Use of these fiber forms is said to materially reduce concrete-construction costs.

Richtubes are made from virgin Kraft, said to give a much stronger tube than that possible with imitation Kraft. A plasticizing treatment makes them weather-resistant and assures easy stripping on the job.

The manufacturer reports that the product meets all job requirements and specifications for forming piers, piles, columns, and underpinning, as well as for encasing wood and steel piling. Richtubes are available in 23 standard inside diameters in lengths up to 50 feet. A line of wax-coated Richtubes is also available.

For further information write to the Richkraft Co., 510 N. Dearborn St., Chicago 10, Ill., or use the Request Card at page 18. Circle No. 133.

MIANUS RIVER DAM and Reservoir, Greenwich, Fairfield Co., Conn., for Greenwich Water Co. Merritt, Chapman & Scott Corp., *Contractors;* American Water Works Service Co. Inc., Phila., Pa., *Consulting Engineers;* DeLeo Bros., Inc., Stamford, Conn., *Excavation Sub-contractors.*

On Mianus River Dam, Greenwich, Conn.

IT'S MACKS 100%

This project, which is being built to insure an adequate water supply for Greenwich, Conn., Port Chester and Rye, N. Y., involves moving 375,000 cubic yards of earth and rock fill.

The dam itself will be 1,200 ft. long, 77 ft. high, 430 ft. across at the base and 20 ft. across at the top. As Mr. Sam DeLeo of DeLeo Bros., Stamford, Conn. excavation contractors, puts it, "We've got a real earth-moving job here, all right.

"To do the best job, and to be sure we fulfill our contract on schedule, we're relying on Macks.

"Ours is a Mack fleet, exclusively. Moreover, the additional trucks we've hired to increase our hauling capacity on this job are Macks. In fact, with us, it's Macks all the way."

DeLeo Bros., like so many heavy construction contractors, have used Macks for years. They know that Macks keep cycle time down over the toughest terrain. Fast, uninterrupted schedules are assured, thanks to Mack's Balanced Bogie and exclusive Power Divider . . . the combination that provides maximum flexibility, even tire loading, uniform braking and positive traction in soft or slippery going.

In addition, the fact that Mack makes more of its own components than any other manufacturer means that Macks are built better from the axle up. They're stronger, require less maintenance, assure longer service life. As Mr. DeLeo says: "It pays to invest in Macks."

MACK TRUCKS Empire State Building, New York 1, N. Y. 3130

For more facts, use Reader-Reply Card opposite page 18 and circle No. 239

The Neo-Flasher Model A-100 warning signal.

Warning signal light for day and night work

■ Suitable for use in the daytime as well as at night is the new construction warning signal announced by the Neo-Flasher Mfg. Co. The manufacturer stresses the economy of operation, reporting that the light will flash continuously on two ignition batteries for 750 hours.

The Model A-100 is equipped with a 7-inch directional head. An alternate head with a 360-degree lens similar to those used on airport runways is also available. Both are designed for use with an aluminum telescoping mast which rises 10 feet from ground level.

The Neo-Flasher is said to be waterproof, and the manufacturer claims the neon tube will never burn out.

For further information write to Neo-Flasher Mfg. Co., Inc., 3210 Valhalla Drive, Burbank, Calif., or use the Request Card at page 18. Circle No. 124.

Rubber pivot joints

Rubber pivot joints for use as resilient bearings at pivot points are described in a bulletin from the manufacturer, Lord Mfg. Co. Dynaflex joints have shock-free action and bonded rubber design. Diagrams point out typical installations of these joints on truck trailers, heavy-duty trailers, industrial lift trucks, and off-highway trucks.

To obtain Bulletin No. 703 write to Lord Mfg. Co., 1635 W. 12th St., Erie, Pa., or use the Request Card at page 18. Circle No. 42.

Brush chipper

■ The Mitts & Merrill brush chipper is an ideal highway and right-of-way maintenance machine, according to a folder from the company. The portable unit with its own power plant grinds a truckload of tree trimmings or brush up to 6 inches in diameter into a barrel of chips in 21 minutes.

To obtain this folder write to Mitts & Merrill, 67 Mc Coskry St., Saginaw, Mich., or use the Request Card at page 18. Circle No. 103.

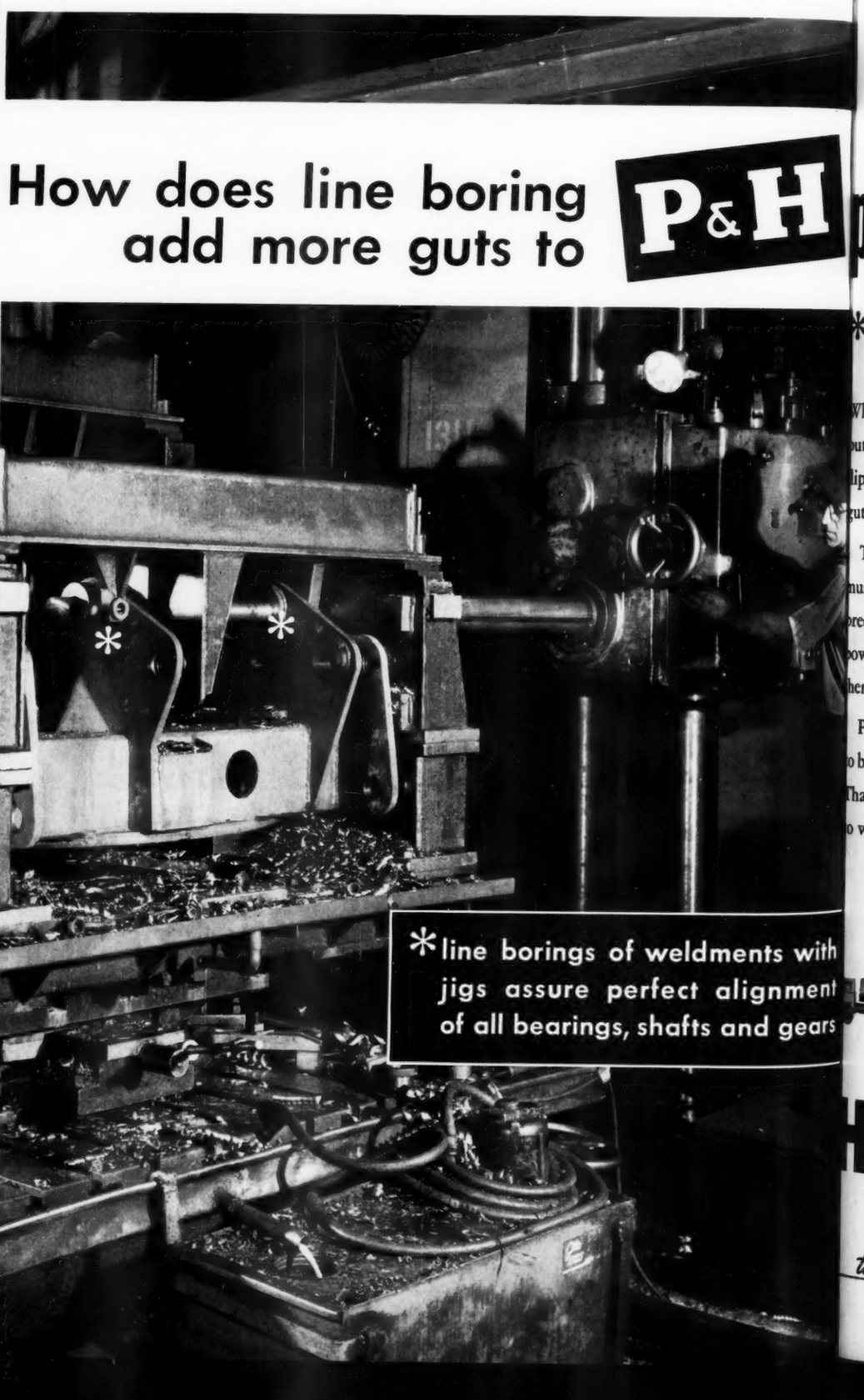
New high-speed mower cuts 15-foot swaths

■ A new "Double V"-type knifehead has been developed by the Triumph Machinery Co. for use with its Hydro-Clipper mowers. The new head, combined with a low-temperature hydraulic governor, makes it possible to simultaneously operate a sicklebar and rotary mower that will cut 10 to 15-foot swaths at 3 to 6 mph, depending on the tractors size and power.

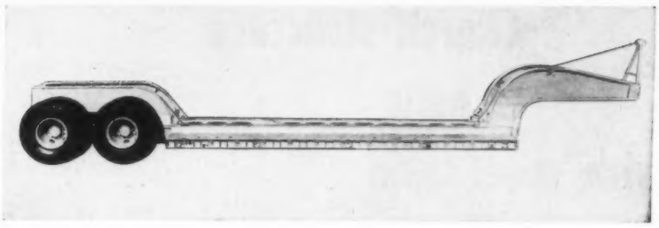
The new knifehead allows operation of the sicklebar mower at much higher speeds than formerly and is reported to increase the wearing surfaces about 10 times over conventional heads. It has long V-tape guides and can be adjusted by simply moving the rear guide forward.

Double V knifehead and Hydro-Clipper mower on an IHC 300 Utility tractor.

For further information write to the Triumph Machinery Co., P. O. Box 110, Hackettstown, N. J., or use the Card at page 18. Circle No. 144.


How does line boring add more guts to P&H
*line borings of weldments with jigs assure perfect alignment of all bearings, shafts and gears

The new 100-ton-capacity low-bed trailer made by the Talbert Trailers, Inc., Lyons, Ill.



New 100-ton trailer loads over either end

■ Talbert Trailer's new 100-ton-capacity Model TDW-100-RG low-bed trailer is a versatile unit said to provide quick, easy, safe over-the-front-end or over-the-rear-end loading by means of Talbert's removable gooseneck and removable rear-axle assembly.

Construction of the rear-axle assembly features full-width solid-bar axles and massive, cast-steel walking beams. Standard specifications call for a deck length of 24 feet, but additional deck length is available on special order. The deck design features drop-side construction which provides a minimum deck height. The addition of a simple wedge device permits road clearance to be raised or lowered, depending upon operating conditions.

Over-all length is 45 feet 7¾ inches, and over-all width is 11 feet. Tire size is 16.00×25-20 ply.

For further information write to Talbert Trailers, Inc., 7950 W. 47th St., Lyons, Ill., or use the Request Card at page 18. Circle No. 54.

Thread inserts usable in stone products

■ Stainless-steel wire thread inserts now being used in stone products permit fastening with standard steel machine screws or lifting such objects with eye-bolts, according to the Heli-Coil Corp.

Two inserts are assembled in line on a hex-head bolt coated with anti-seizing compound. They are then hand-fitted into a diamond-drilled hole of the proper diameter in the stone after the hole and the outer surfaces of the inserts have been coated with a special glue.

Because of the durable thread provided by the inserts, the bolt can be assembled and disassembled hundreds of times with little wear, according to the manufacturer.

For further information write to the Heli-Coil Corp., 1496 Shelter Rock Lane, Danbury, Conn., or use the Request Card at page 18. Circle No. 134.

Sieves and shakers

■ Sieves made to conform to the specifications of the National Bureau of Standards and the American Society for Testing Materials are featured in a bulletin from Soiltest. The 8-inch diameter sieve (as well as those in other sizes) has a cloth attached directly to the frame, and a nameplate on each sieve gives the number, microns, and nominal opening in millimeters or inches. Also shown are the portable, motorized, and Ro-Tap sieve shakers. Sample splitters and a mechanical testing screen are described. Complete specifications and prices are listed.

To obtain this bulletin write to Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 21.

Passenger conveyor

■ The Speedwalk, a passenger-conveyor system, is described in a bulletin from Stephens-Adamson Mfg. Co. Artist's sketches illustrate possible applications of the system. Also covered is the Carveyor system, which uses small cars riding on belts at speeds up to and above 15 mph to handle passengers.

To obtain this bulletin write to Stephens-Adamson Mfg. Co., 275 Ridgeway Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 101.

power cranes & shovels ?

*It puts power to work; eliminates wasteful friction

Why waste power in friction? P&H design puts power to work for you at the hook or dipper. That's another way we put more guts in P&H power cranes and shovels.

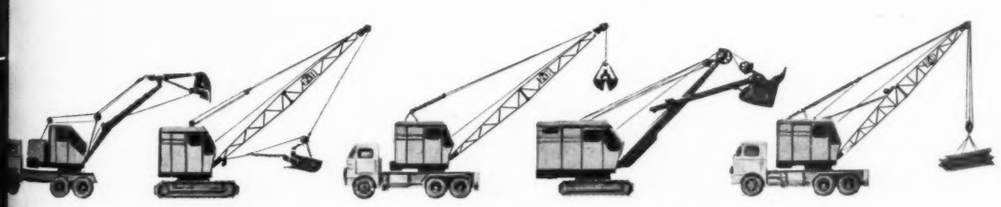
To eliminate waste friction, bearings must be in perfect alignment. That calls for precision manufacture. So P&H starts with powerful, rigid weldments. Then, line-bores them, using fixtures and jigs.

P&H bearings, shafts and gears just have to be in perfect alignment with this method. That's why P&H proudly says we put power to work; eliminate wasteful friction.

What's more, shafts, bearings and gears stay in alignment for keeps . . . with the roughest terrain, digging or lifting. P&H all-welded carbodies don't twist and bind.

Is it any wonder you get more value with P&H? All-welded to put more guts in every ounce of steel. Line-bored to eliminate wasteful friction; put the power to useful work.

No matter what your shovel or crane requirements, you'll get more for your money with P&H. See your nearest dealer for more reasons why. Harnischfeger Corporation, Milwaukee 46, Wis.

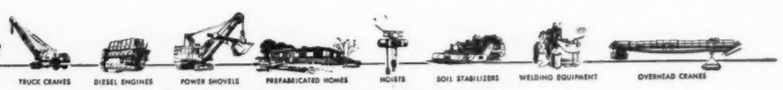


For Modern Engineering, Look to

HARNISCHFEGER

Power Crane & Shovel Division

the P&H Line



For more facts, use Reader-Reply Card opposite page 18 and circle No. 240

Church structure is built with steel, and concrete frame

Paper-backed metal floor lath spans between joists or purlins to provide forms for floor or roof slabs

Safway scaffolding, reaching to the top of the second floor level, is used by men working on the masonry exterior of the building. Wings running at right angles to the chapel (center) will contain offices, classrooms, and recreational facilities. *C&E Staff Photo*

A combination of steel and concrete framing, together with ashlar masonry and tile walls, will give dignity and permanence to the new First Presbyterian Church building that will be completed next month in Oklahoma City, Okla.

The block-long Z-shaped building, for offices, classrooms, chapel, dining area, and recreational facilities, is a two-story and basement structure 320×200-feet over-all. The chapel, seating 270 people, will be used as a place of worship until the large sanctuary, which will be connected to the recreational building, is completed.

Construction of the sanctuary was postponed when the cost of the structure was found to exceed funds available for the work. Bids received in the fall of 1954 were rejected to permit plans to be revised so as to reduce the cost of the new facility, and Lippert Bros., Inc., Oklahoma City, Okla., was awarded the more than $1.2 million contract on the revised basis late in December, 1954.

Parr & Aderhold, Oklahoma City architects, designed the structure to include a 60×100-foot social hall with a stage, clubrooms, bowling alley, shuffleboard courts, and a floor for dancing and skating in this wing.

Site preparation subbed

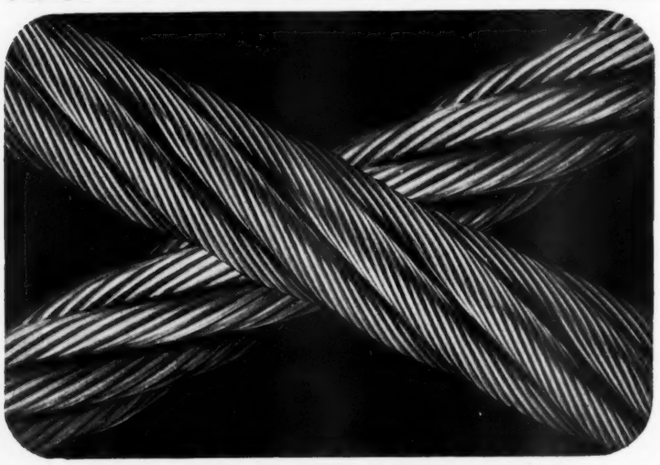
The excavation and site-grading operations, sublet to Concho Construction Co., Oklahoma City, Okla., was started early last year as the firm moved in two backhoes, two tractor-loaders, and several other items of equipment. A Caterpillar D7 tractor with LeTourneau FP scraper stripped the topsoil from the site, stockpiling it in one corner for use in finish grading.

Several machines teamed up to dig the basement and footing excavations. A Koehring 205 backhoe and a Northwest 25, both with shovel and backhoe attachments, were assisted by an Allis Chalmers HD-5 tractor with Tracto-Shovel front-end loader and a Caterpillar D4 with a Traxcavator loader. These rigs loaded the material into hired trucks. Some of the excavation at the site consisted of shale that was of such good quality that it was sold to the local brick-manufacturing firm.

Sand rock, too hard to be excavated without being scarified, was loosened by a Caterpillar D7 tractor with an Aaron adjustable dozer-ripper. Later, as basement walls were built, the backfill was placed by the Allis-Chalmers HD-5 tractor-loader and compacted by a Barco gasoline-powered tamper.

The footing trenches were dug to

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

Contact your Roebling distributor or write us for the full story.

ROEBLING

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 241

Ready-mix concrete is hoisted to the 1½-yard hopper at second-floor level by a Link-Belt Speeder crane with Gar-Bro ½-yard bucket. Concrete is being buggied to pours.
C&E Staff Photo

accurate line and grade in the sand rock so that forming was not needed for concrete placed directly from the transit-mix trucks. The exterior basement walls were 14 feet high and from 12 to 20 inches thick. They were formed with plywood panels and lined with Masonite form liner, screen side to concrete, and backed by 2×4 studs and double 2×4 wales. These forms were tied with Ankorite snap ties spaced at 2-foot centers on the wales. The lower three wales were spaced at 16 inches, and the rest, at 2 feet.

Columns formed with ¾-inch plywood were tied with Symons column clamps. Beams of the floor system were formed with 2-inch lumber bottoms supported on 4×4 shores. The 2×8 joist soffits for the Ceco pan floor system were supported on ledgers on the plywood beam sides, and were shored with adjustable steel shores at 4-foot centers. The 12×20-inch Ceco pans were set to provide 6-inch joists and a 2½-inch floor slab.

The placing and finishing of concrete was done by Cotner & Cotner, cement contractor, Oklahoma City. Footing and basement-floor pours were made directly from the transit mixers. Columns and first-floor pours were made by Lippert's Link-Belt Speeder crane with a Gar-Bro ½-yard bucket. Some of the concrete for the second floor of the frame was bucketed to a 1½-yard hopper by the crane, then transported to the forms in buggies.

Concrete was worked into the forms with the aid of Mall gasoline and electric-powered vibrators, and finished floors were troweled with a Whiteman power finishing machine.

Steel, concrete frame

The concrete frame in most areas of the building carries from the spread footings on the sandstone up through the second floor level. Above this level the framing is entirely of structural steel. The entire exterior is Tennessee blue-gray random ashlar masonry, backed with tile and trimmed with gray Indiana limestone. Pitched portions of the roof are natural slate with built-up roofing on the flat portions. Roof decks are gypsum concrete on tees and gypsum board for the flat roofs and 3-inch nailing-type gypsum tile on pitched roofs.

The structural steel framing was supplied by Robberson Steel Co. and erected by Webster Steel Erectors, both of Oklahoma City. Webster used a Michigan truck-crane to erect the steel frame and to set the Robberson steel joists, which were used for some of the ceiling and roof spans.

(Concluded on next page)

Black & Decker® HEAVY-DUTY SAWS ARE POWER-BUILT to last!

We don't buy motors—we build them!
The *heart* of your electric tool is the motor—completely built by Black & Decker. All the power you need and then some . . . because each motor is built for a specific tool and the job it must do. B&D motors always *stand up!*

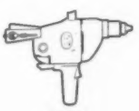
NEW 6½" Saw races through 2x4's... even at a 45° angle

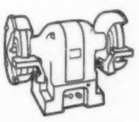
Black & Decker offers *the complete heavy-duty* saw line—with enough power and versatility for every professional need. This *new* B&D 6½" Heavy-Duty Saw (shown above) makes all cuts in 2x10 and smaller lumber, even at a 45° angle with *blade to spare!* And all B&D Saws—6", 6½", 7", 8" and 9" models—handle practically any building material: ferrous and non-ferrous metals, corrugated sheets, ceramics, tile, slate, Transite.

Latest safety features, latest *convenience* features—telescoping guard, larger lift-lever, instant-release trigger switch; calibrated quadrant, larger wing nuts, for faster, easier depth and bevel adjustments . . . clear-view operation . . . easier cutting from right or left side! Every B&D Saw is *Power-Built* for years of satisfactory, efficient service! See your B&D distributor or write: The Black & Decker Mfg. Co., Dept. 7904, Towson 4, Md.

SANDERS

HAMMERS

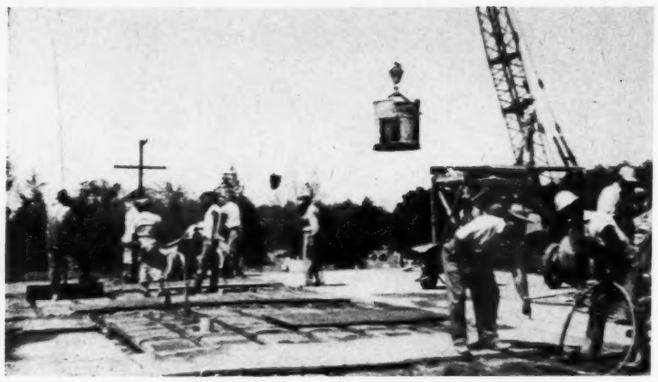

DRILLS


BENCH GRINDERS

SERVICE . . . one of 42 Black & Decker factory service branches is located "next door" to you. Staffed by experts to give you fast, efficient service, genuine replacement parts.

LOOK IN THE YELLOW PAGES UNDER "TOOLS-ELECTRIC"
Black & Decker®
PORTABLE ELECTRIC TOOLS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242



Concrete is worked down around reinforcing steel by workmen with Mall electric and gasoline-driven vibrators. *C&E Staff Photo*

(Continued from preceding page)

In the attic machine platform, where the steel framing was used, the concrete floor was placed on Pittsburgh Steeltex paper-backed floor lath. This fiber-reinforced waterproof paper was suspended from a 3×4-inch No. 12 welded wire fabric by wire ties. The paper hung about an inch below the reinforcing to provide the form for the concrete. The Steeltex was laid across the joists or purlins, to which it was attached with wire clips. A Steeltex stretcher tool, supplied with the material, pulled the wire mesh tight as it was attached to the steel frame.

To place the concrete in some of these higher areas, the contractor brought in an American S6 25-ton crane. This truck-crane was equipped with 130 feet of boom and a 15-foot jib that enabled the rig to reach to practically all of the upper parts of the structure with the concrete bucket. This crane also set the T-bars for the gypsum roof.

Ceco steel subframes for the steel window sash were set in the masonry, and door bucks were attached to the concrete floors with the aid of a Drive-It powder-actuated tool.

Masonry exterior

Masonry construction, sublet to J. T. Majors & Son, masonry contractors, Oklahoma City, was done by a big crew that worked on a large part of the building at one time. As work was carried up above ground level, a Safeway tubular steel scaffold was erected around the exterior of a large part of the building to support the workmen. This scaffold was carried from the ground to the top of the second floor level.

Stone and tile were raised to the scaffold by Sam Mulkey conveyors reaching as high as 31 feet from the ground. The large cut-stone trim pieces were set by an International truck equipped with a winch and a very long A-frame and boom. This rig set the pieces of stone as high as the top of the second floor level of the building.

The large amount of fine millwork going into the interior of the structure constitutes one of the most painstaking and important phases of the general contract. This work on the portion of the structure presently under contract is scheduled for completion next month. The contract for the sanctuary, which will complete the structure, is expected to be awarded within a year.

Superintendent for Lippert Bros., Inc., is L. R. Burroughs. William G. Parr and Jack R. Nusbaum made frequent visits to the job for Parr & Aderhold, the architects.

THE END

Safety plate added to bit detacher

■ A modification in its BD-282 bit detacher has been announced by the Le Roi Division of the Westinghouse Air Brake Co.

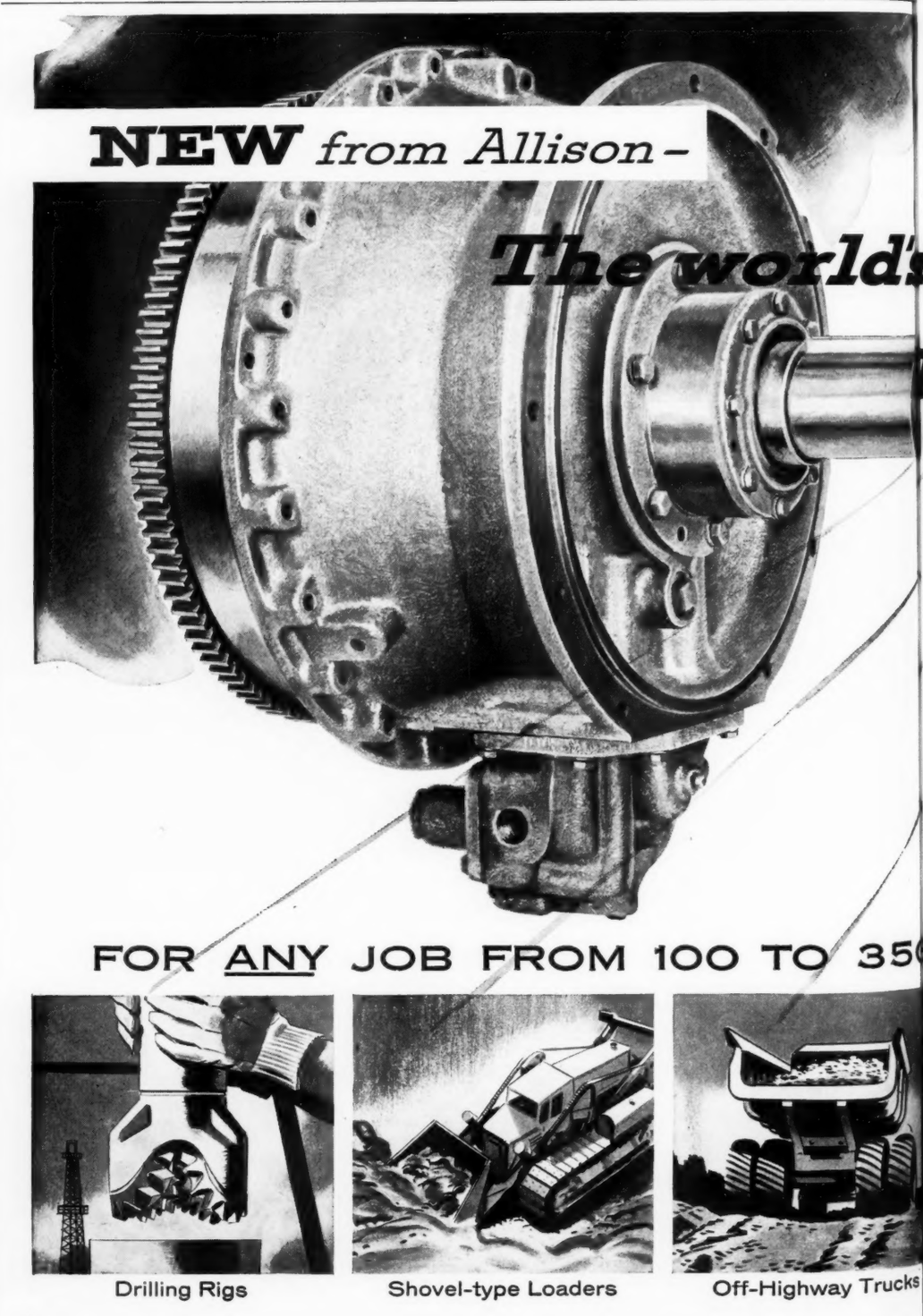
Used to detach "one-use" bits from drill steel, the detachers are now manufactured with a plate covering the bit and the end of the steel as a safety feature. The detacher can be operated only when the cover is in place, preventing injury from breakage or spalling of bits or steel.

The BD-282 detacher is used to remove Le Roi-Cleveland CRD and Vac-nu-matic one-use bits.

For further information write to the Le Roi Division, Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis., or use the Request Card that is bound in at page 18. Circle No. 132.

Malan names supervisor

As part of its expansion program, the Malan Construction Corp., New York, N. Y., has named William T. Dickey to the firm's engineering staff. Mr. Dickey will supervise construction of Malan projects in Ohio and adjoining areas.



Spot welding lowers cost of steel wall covering

A portable sigma spot-welding machine is used to fabricate the protective steel covering for the Seattle, Wash., post office. A joint between the 16-gage steel tabs and 14-gage steel plate is made in about eight seconds.

Spot-welding proved to be the most economical method of fabricating a 14-gage steel covering to protect the concrete block walls of the U. S. Post Office building in Seattle, Wash.

When Howard S. Wright Co., Seattle, completed this job, the total savings resulting from the use of the spot-welding method came to $1,400.

Wright used a portable sigma spot-welding machine to join the 14-gage steel plates to 16-gage steel tabs set in the masonry walls. These tabs were spaced 20 inches apart horizontally and 16 inches apart vertically.

The steel sheets were clamped into place before they were welded, and the plate fitter marked the location of each tab in chalk on the outside of every place. A welding operator followed with the sigma spot-welding machine to make the welds, each of which has a tensile strength equal to a ⅛-inch steel rivet. The average time needed to complete each joint—including time for positioning, holding, and welding—was about eight seconds. Little or no grinding was needed to complete the work.

THE END

Corrosion inhibitor protects stored machinery

■ A corrosion inhibitor for idle and stored construction machinery and tools is available from the Al-Con Chemical Co. in either porous shaker bags or spray bottles.

The 2-ounce bags of crystals, known as V-B-i, are hung in strategic places on the equipment to be protected. A slight shaking of the cotton sacks will cause some of the inhibitor to sift out and coat the metal. Inhibitor powder, called R-i-P, is sprayed directly on the metals from 4-ounce plastic bottles.

Under normal conditions, a 2-ounce bag of V-P-i is said to protect equipment in a 30-cubic foot enclosure for as much as two or three years. It is not necessary to seal the equipment hermetically.

For further information write to the Al-Con Chemical Co., P. O. Box 8168, New Orleans 22, La., or use the Request Card at page 18. Circle No. 129.

Metal lath specifications available in new booklet

The 1956 edition of "Specifications for Metal Lathing and Furring" is currently being distributed, without charge, by the Metal Lath Manufacturers Association, Engineers Building, Cleveland 14, Ohio.

The 16-page booklet, covering all types of metal lath construction, includes specifications for solid and hollow partitions, and wall furring, metal lath attached directly to wood supports, beam and column protection for fireproofing, and reinforcing for exterior stucco as well as specifications for contact, furred, and suspended ceilings.

Scaffold and parts

■ Scaffolding for rolled-beam bridges, bypasses, and inside and outside construction maintenance is featured in literature from Swing-Lo Suspended Scaffold Co. A variety of models and sizes, and scissors, hangars, bar joist, etc., are shown.

To obtain this literature write to Swing-Lo Suspended Scaffold Co., Covert, Mich., or use the Request Card at page 18. Circle No. 18.

d'most versatile

TORQUE CONVERTER

Now, from Allison, comes the world's most versatile torque converter—the Series 500 TORQMATIC—to give you more power over a wider working range and permit you to standardize on *one* type of converter for *all* your equipment.

In *one standard housing* it gives you a choice of 4 ranges, 7 torque ratios, 100 to 350 horsepower coverage.

It's available for practically any application—automotive, industrial or a combination of both.

And it's designed for rough, tough service in scores of fields—construction, mining, oil drilling, logging, materials handling—wherever gasoline or Diesel engines are used.

This new Series 500 TORQMATIC Converter embodies every engineering advance developed by Allison in building tens of thousands of TORQMATIC Converters over the past seven years.

In many applications it will permit the use of lower horsepower engines with no reduction in *working* power because it multiplies engine torque (true measure of an engine's *working* ability) from 250% to 360%.

And the new Series 500 TORQMATIC Converter will also permit engines to run in their best speed range—transmit more power in the high-speed range.

Soon you will be able to get the TORQMATIC 500 in scrapers, off-highway trucks, log loaders, drilling and servicing rigs, shovels, cranes, graders, industrial locomotives, ditchers and shovel-type loaders made by a score or more manufacturers.

For the names of these manufacturers and full details on the TORQMATIC *Series 500 Converter write to:*

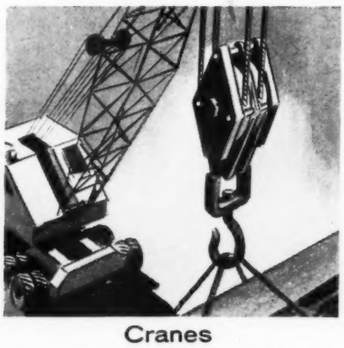
Allison Division of General Motors
Box 894C, Indianapolis 6, Indiana

GM MORE POWER FOR YOU

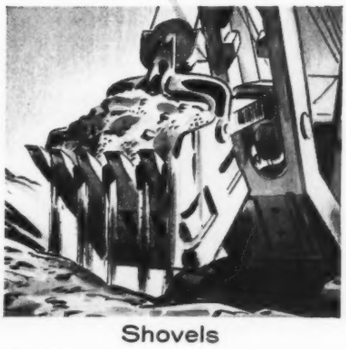
GM TORQMATIC Allison TORQMATIC DRIVES

35 HORSEPOWER

Graders



Cranes



Shovels

For more facts, use Reader-Reply Card opposite page 18 and circle No. 243

Bigger push plates, lower draft arms, and redesigned bowls enable the new International Payscrapers to load and dump quicker than previous models. Turbocharged diesels drive both the "75" and the "55" at speeds to 24 mph.

New motor scrapers feature bigger payloads, new bowl design

■ Bigger payloads, powerful turbocharged diesel engines, and improved bowl design distinguish the 1956 Payscraper line. The International Harvester Co.'s new self-propelled, rubber-tire scrapers are the 262-hp "75" and the 172-hp "55." The power unit in both models is a Cummins turbocharged diesel engine.

The capacity of Model 75 has been increased to 20 cubic yards heaped and that of Model 55 to 14 cubic yard heaped. Other changes in the new units are found in a straight-back bowl, lower draft frame, greater visibility, new "cerametallic" clutch facing (on the "75"), higher apron lift, bigger push block, and improved ejector.

The back of the Payscraper bowl has been redesigned so that it is similar to that of a dozer blade. The dirt boils back into the bowl from the cutting edge, fills the corners, and heaps a full load in seconds.

The "cerametallic" clutch is made of a combination of powdered metals and ceramic materials similar to those used in jet airplane brakes. The new clutch is said to provide more positive clutch engagement than before and reduce slippage. Adjustment is needed less frequently, and clutch life has been lengthened considerably, according to the manufacturer.

The apron lift is now higher than in the previous models, which assures speedy ejection of all material. The apron closes fast with guillotine-like action. Arms are now outside the bowl, away from the dirt, and allow the apron to close quickly and positively. A wider and bigger push block permits the operator of the push tractor to make positive contact with minimum effort.

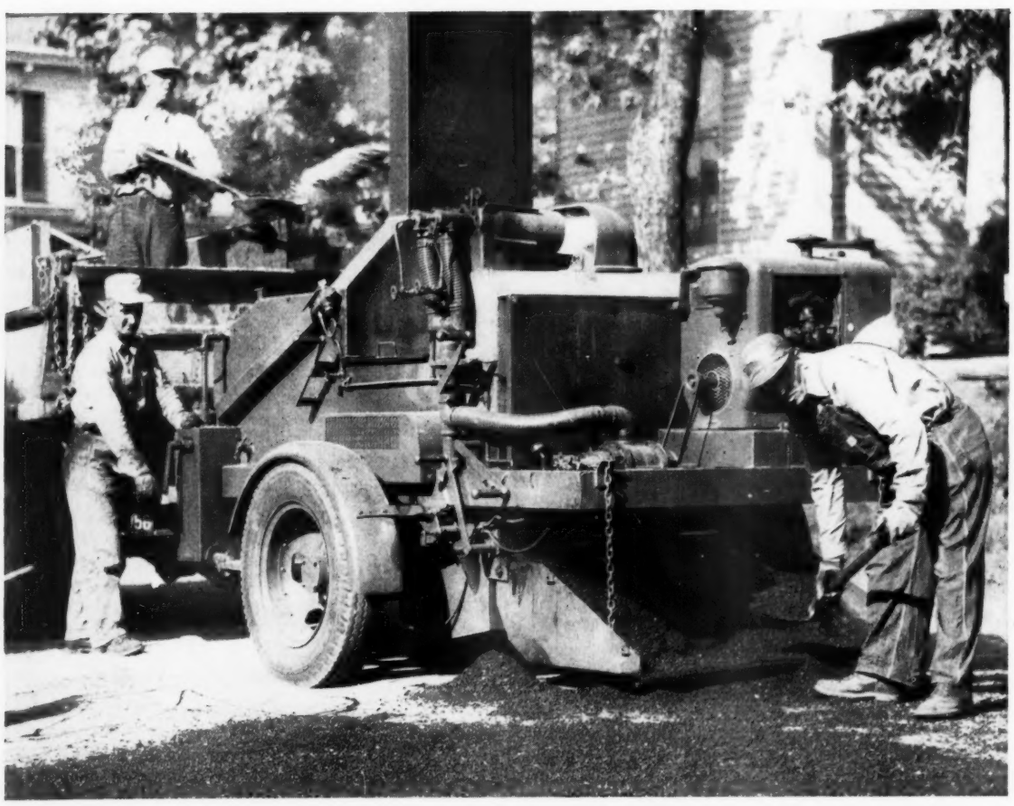
Visibility, too, has been improved in the 1956 Payscraper line. The lower draft frame gives the operator improved vision of both the bowl and the push tractor. The operator sits on a thick foam-rubber seat with operating controls grouped conveniently within easy reach. Longer, wider fenders give added protection not only to the operator, but to the unit as well.

Heavy-duty, two-shoe air brakes are synchronized on both tractor and scraper wheels. In addition, an auxiliary hand brake provides individual braking of the drive wheels for "walking" out of rough terrain

Multiple-disk cable control and Hydro-Steer power steering are other features.

For further information write to International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 147.

Help the Red Cross to stay on the job serving our neighbors everywhere in the proud tradition of 75 years.



Give each crew its own asphalt plant *and save $1.82 on every ton!*

The Littleford Trail-O-Patcher is a complete, self-contained portable asphalt plant. It's so convenient and economical, you can afford to provide each of your crews with its own bituminous mixer.

In fact, when you consider the $1.82* per ton saving, you can't afford not to keep several Trail-O-Patchers on the job continuously. You can mix as much as you want, anywhere and at any time of the year.

To appreciate the full significance of the increased convenience, efficiency and economy the Littleford Trail-O-Patcher now makes possible in bituminous mixing, send today for your free copy of bulletin 28.

*$7.00 From asphalt plant
5.18 Trail-O-Patcher mix
$1.82 savings per ton

LITTLEFORD *Tops in Black Top!*

LITTLEFORD BROS., INC. 485 E. Pearl St., Cincinnati 2, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 244

Electric impact wrench has variety of uses

■ Thor Power Tool Co. is marketing a new version of its ½-inch square-drive universal electric impact wrench. Designated as the No. 56 SpeedWrench, the new tool replaces the Model 55 introduced more than a year ago.

This new tool is designed for fast nut setting and removal. With specified attachments it can also be used for drilling in steel, wood, stone or other materials, as a screwdriver, and for tapping, driving, or removing studs.

One of the features of the No. 56 is one-hand operation through a finger-tip reverse button located in the handle behind the starting trigger. Single switch efficiency is made possible by concentration of all electrical connections in the handle. According to the manufacturer, longer life is achieved by the provisions made for reversing the current instead of shifting commutator brushes.

The new SpeedWrench is 9⅝ inches long over-all, weighs 7 pounds, and has a 1 7/16-inch offset. It develops forward and reverse speeds of 1,900 rpm and delivers 1,900 blows per minute. It is driven by a universal electric motor, and standard models are rated at 115 volts.

For further information write to Thor Power Tool Co., 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 89.

Concrete-handling line

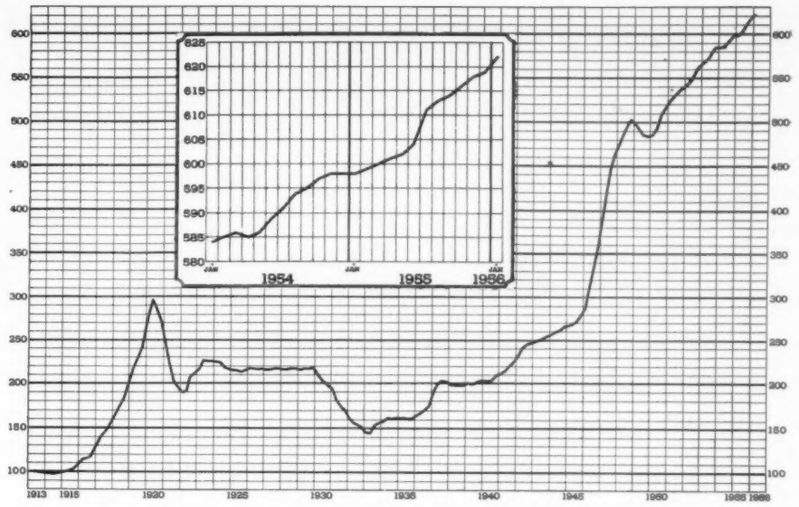
■ Action shots of crews using the Gar-Bro line of concrete-handling equipment are contained in a catalog from the firm. Complete details are given on various models of concrete buckets, hoppers, powered crane hooks, concrete chutes, carts, wheelbarows, bins and batchers, and vibrators.

To obtain Catalog No. 300 write to Gar-Bro Mfg. Co., 2415 E. Washington Blvd., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 41.

Contractor's buildings

■ A mailing piece from Pennington Mfg. Co. features the Hideaway, a machine and repair shop, and the Tee Pee, a tool storage shed for construction materials. Both units are zinc-coated, precut, portable, and made with ribbed steel walls.

To obtain this mailing piece write to Pennington Mfg. Co., 190 Commercial Road, Addison, Ill., or use the Request Card at page 18. Circle No. 22.

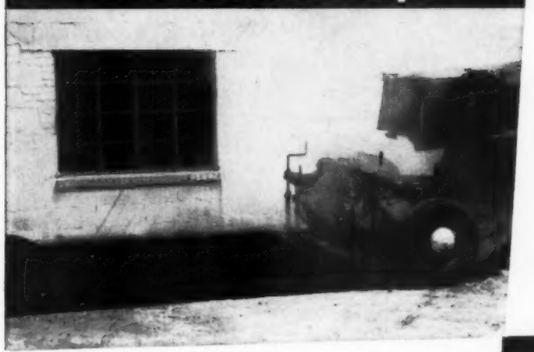


AVERAGE CONSTRUCTION, material, and labor costs shoot to a new high in the first months of 1956. This American Appraisal Co. index graph, showing cost trends from 1913 on, is based on costs of frame, brick, concrete, and steel building work in 30 representative cities.►

NEW LITTLEFORD TRUE-LAY PAVER-SPREADER...

lays 100 tons of bituminous concrete per hour

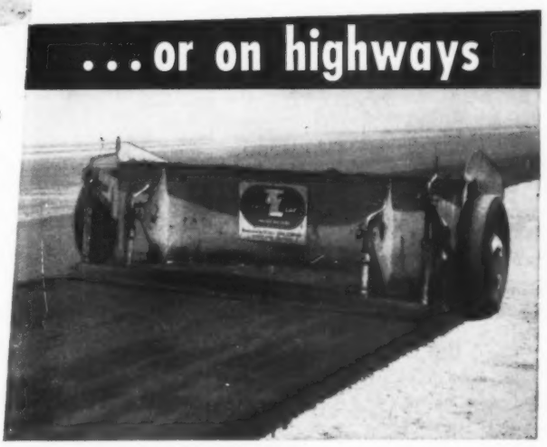
...in driveways



Does more things better:

1. Lays mat from 4-ft to 10-ft wide, up to 6" in depth
2. Spreads 4" maximum size stone, too
3. Compaction equals up to 80% of mechanical tamper
4. Cuts labor costs 65%
5. Paves close to curb or buildings

...or on highways



The 2-in-1 Littleford True-Lay tow type paver-spreader is designed for paving bituminous concrete in driveways, alleys and confined areas where heavy, cumbersome units won't fit. Operates efficiently and profitably in the wide open spaces, too. Cuts labor costs up to 65% and will quickly pay for itself. For complete information, send today for bulletin GG-32. Littleford Bros., Inc., 485 E. Pearl St., Cincinnati 2, Ohio

LITTLEFORD

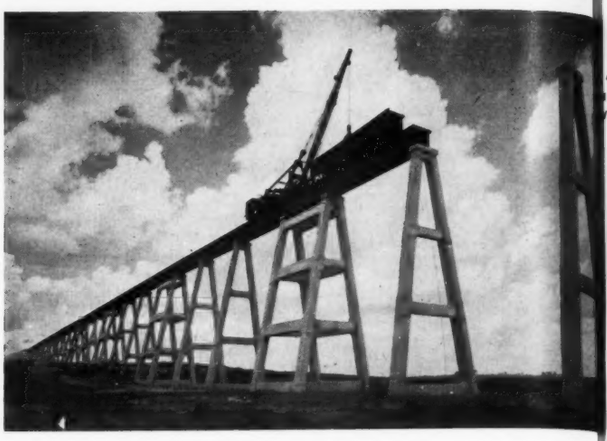
Fastens to front bumper of any standard dump truck.

Wheel adjusted to ride on top of fast pass

Carried on dump truck gate.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 245

portrait in print



E. E. Barber builds a business on know-how and hard work

He makes bridge building look easy

by RALPH MONSON

At the depths of the depression, when the future looked blackest for American businessmen, E. E. Barber plunged into business for himself in the bridge-building and contracting field. This alone might qualify him for honorary membership in an optimists' club. But at this time, in 1933, his sole tangible assets consisted of $1,500, a 40-acre farm, and two automobiles.

Of just as much, or more, value were his intangible assets: a wealth of know-how in the bridge-building field, gained through working on bridges for the bridge department of the Frisco railway and on the bridge crew of List & Weatherly Construction Co., Kansas City, Mo.

One of the most valuable of his intangible assets was his personal acquaintance with several railroad officials, including Col. F. G. Jonah, then chief engineer of the Frisco; and R. P. Hart and W. J. Headley, who were at that time bridge engineers for the Missouri Pacific and the Wabash lines, respectively.

One of Barber's first moves after setting up E. E. Barber Construction Co., Inc., Fort Smith, Ark., was to get in touch with these three men and ask to have his name placed on their bidding lists. A few days afterward, he successfully bid a steel bridge repair job at Gasconade, Mo.

Before this first job was finished, Col. Jonah had asked the new firm to bid on five other jobs. Barber not only bid, but got, all five. He was in business up to his neck. His initial problem—that of getting jobs—now became the problem of getting jobs done.

Firm gains stability

Working hard, and working long hours, Barber met and handled many critical situations in the early days. One of the jobs required air tools, and these were purchased on credit, pending payment of the estimate at the end of the first month of work.

One week there was not enough money on hand to meet the next payroll, so Barber, after prevailing upon the resident engineer to prepare an estimate of the work then under way, took the estimate to the railroad office and got a check big enough to cover the payroll.

As the firm completed job after job,

"They've passed 150,000 rough, tough miles—and

Hauling Contractor H. L. Harvell reports on his GMC *Diesel dumps—hauling a million tons of crushed rock on Florida Flood Control project*

THE bidding was sharp when Hanford Harvell figured on the huge Central and South Florida Flood Control job two years ago. For he was not only competing against other truckers—but traditionally low-priced haulers of bulk materials.

"I couldn't have submitted the figures I did—if I hadn't had plenty of confidence in my GMC's," Harvell says. "But I'd had plenty of experience with their low costs—and sure-fire dependability—on many a tough job. And the new GMC Diesels are doing even better than I expected.

"Take just their maintenance savings. Some of my trucks have put in better than 150,000 miles—and nary an overhaul yet. My newest GMC has clocked 29,000 miles in the past 90 days. And I've had no down-time at all.

"Fuel savings are just as good. In fact, I'm getting 7 miles to the gallon. And that's on heavy hauls

43-ton girder for the high-level railroad trestle over the Texa- Reservoir in Oklahoma is set by a specially made derrick ith 75-foot boom. This was one of Barber's more recent jobs.

it gained in experience and economic stability. In 1938, E. E. Barber Construction Co. completed work on the superstructure of the Atchafalaya River Bridge at Simmesport, La. A few years later, in 1943, the firm completed the erection of 6½ million pounds of steel for the bridge carrying the Frisco railroad over the Texahoma Reservoir near Denison, Texas. Bridges across the Arkansas River at Ralston, Okla., and the Washita River at Lindsay, Okla., followed. A $1¼ million series of bridges carrying the Cotton Belt and the St. Louis & Southwestern railroad across the Texarkana Reservoir near Texarkana, Texas, was completed before current work really got rolling on jobs for the Oklahoma Northeast Turnpike and the Arkansas State Highway Commission.

Barber's ingenuity and his ability to work with other people were combined in one incident during the Texarkana job. Each of the eight bridges in the project required about 150 tons of structural steel that had to be shipped to the site by rail. The low-level tracks of the existing roadbeds were close to and parallel to the new high-level track being built, but there was no convenient spur track for unloading the steel.

Standing at the edge of the excavation, Barber gives signals to the operator of a Link-Belt Speeder LS-98 crane during pier excavation for the Verdigris River bridge on the Oklahoma Northeast Turnpike. Virtually all Barber's time is spent in the field.
C&E Staff Photo

Rather than unload at some distance from the bridges and truck the steel to the site, Barber arranged with the chief engineer of the railroad to hold up the local freight train while steel was unloaded from the cars on the main line. He promised to unload the 150 tons of steel for one of the bridges in two hours.

Cranes and workmen were waiting when the first load arrived, and within an hour and fifty minutes, the entire shipment was unloaded. A little more practice on subsequent shipments enabled Barber's crew to unload steel for a complete bridge in an hour and thirty-five minutes.

Another Barber "speed-up" technique on the Texarkana job made some observers shake their heads at first, for Barber had all 27 piers in the project under construction at once. This "shotgun approach" worked well, however, as forms, crews, and equipment shuttled back and forth from one pier to another permitting maximum re-use of forms and losing only a minimum of time during the work.

Safety record

Throughout his contracting experience, Barber has never relaxed his demands for an adequate safety program on his jobs. In selecting a foreman or supervisor, he looks for a man who can meet three requirements: workmanship comes first; safety on the job is the second essential; a man's ability to produce work at a profit is the third consideration. According to Barber himself, "a man's ability to work safely is his ability to work."

But Barber is not a man to be satisfied in following safety programs. He creates them. His comprehensive and workable safety code takes up less than four typewritten pages and consists of some 50 concise statements.

The opening general section, deal-

Hustling 17 tons of crushed stone at a clip, this brawny Diesel tandem supplies foundation material for pumping stations along the canal. This model—rated at 46,000 GVW—is from GMC's new Blue Chip heavy-duty line blanketing the hauling range all the way up to 59,000 GVW-90,000 GCW. *Extra-stamina engineered* from rims to roof, these GMC's now offer full-length channel frame reinforcements as a factory-installed option—when required for exceptionally severe service.

"I never hesitate to recommend GMC's to other haulers," declares Hauling Contractor Hanford Harvell. "In fact, the way my rigs stand up to any job has probably influenced the buying of about 175 other GMC's in this area alone. It's a GMC for me—every time!"

Power to move big loads—fast—comes from the GMC's new 4-71 Diesel engine. It's one of the great new Blue Chip line of power plants—offering a choice of six cylinder or V8 gasoline engines—four or six cylinder Diesels. All of them give you power aplenty to move top-capacity loads on fast-moving, tightly scheduled jobs—even through tough off-the-road conditions to the job-site. And that's where the driver also appreciates Safety Power Steering—standard on some models; optional at extra cost on others.

–and still no overhauls!"

that average 300 to 500 miles every day."

Harvell's experience unusual? Not among hauling contractors using GMC's brawny new construction haulers. They've found that new Blue Chip GMC tandems—gasoline or Diesel—handle bigger jobs at lower cost than anything else around. *Yet their price tags are below those on competitive equipment.*

Now is the time to talk over your needs with your GMC dealer!

GMC TRUCK & COACH
A General Motors Division

For more facts, use Reader-Reply Card opposite page 18 and circle No. 246

ing with the responsibilities of the contractor and his employees, states in part that "the contractor will see to it that all employees are provided with the most practical tools and equipment and safe working conditions".

The same section also states that "foremen will be held responsible for the safety of employees under their direction", and that "workmen must report any accident or injury to their foreman, no matter how minor the accident or injury".

The second section, concerned with health and sanitation, deals with drinking water supplies and toilet facilities. The next section details first-aid facilities and how they are to be used. Another section on equipment for the safety of personnel states that iron hats will be worn "when they will add to the safety of the work", and life jackets will be furnished employees" working over and around water".

Provisions for adequate night lighting for work areas and equipment are covered in two sentences. Four sentences cover fire protection. The final section, titled "Job Site Protection", is designed to assure good housekeeping in the shops and at the job site. This section also provides for the licensing of vehicles and operator, and covers a number of miscellaneous matters.

With one sentence—"All employees will be given a copy of these safety rules . . . and each employee . . . will be expected to convince the contractor's official representatives that he has read the same by being able to discuss the various safety suggestions . . ."—Barber makes sure that every employee understands the entire program and carries it into practice.

Barber's safety program is so simple as to be deceptive. Certainly it was deceptive to government officials meeting with Barber on a safety program at the start of a big bridge contract for the U. S. Army Corps of Engineers a few years ago.

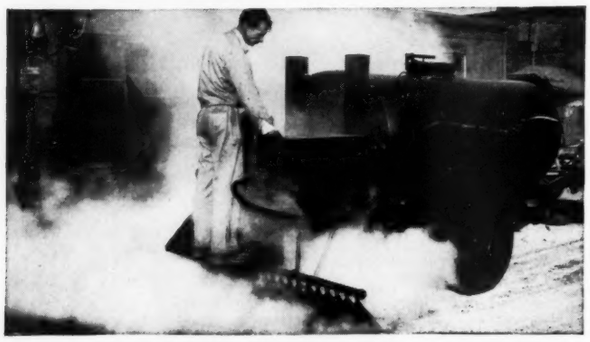
At the start of the conference, Barber was presented with a copy of a safety code and told he would be expected to follow it. Taking a hurried look at the code, Barber asked if he might be allowed to substitute his own regular safety program.

The skeptical officials agreed to let him submit a copy of his program for consideration. After studying the Barber program, the officials gave their immediate consent for its use. Three months later, they had substituted Barber's program for their own.

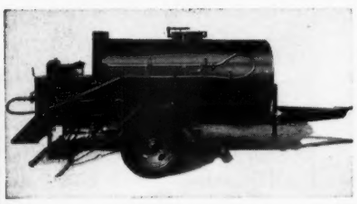
Perhaps the highest recognition for Barber's safety program came in 1954, when his firm was given an award for its excellent safety record of the preceding five years by the Associated General Contractors. The coveted award simply confirmed what Barber already knew—it is good business to conduct operations safely.

Aside from the award, Barber takes

STANDARD STEEL "S-J"
Maintenance Distributor



for VERSATILITY — EFFICIENCY — ECONOMY



HANDLES ASPHALT OR TAR—FOR PATCHING—SEALING—RESURFACING—CRACK FILLING—OR SURFACING DIRT OR GRAVEL ROADS

WORKS FAST—FAR AHEAD OF THE GRAVEL GANG

Standard Steel S-J Maintenance Distributor, designed specifically for jobs where the use of bigger equipment is costly and impractical, can be moved rapidly from one location to another for patching, shoulder repair or construction of secondary roads . . . It is equipped with suck back spray bar which permits closing of the discharge valve and pulling back all surplus material in the spray bar and piping for quick cleaning . . . All piping and valves are flanged to permit easy repair replacement . . . The draw off valve is on curb side for safety . . . and coilless self-generating burners are standard equipment as well as a Viking special asphalt pump which can be completely drained, eliminating the necessity for thawing when the unit is started cold. Write for complete details on the 1955 Model S-J.

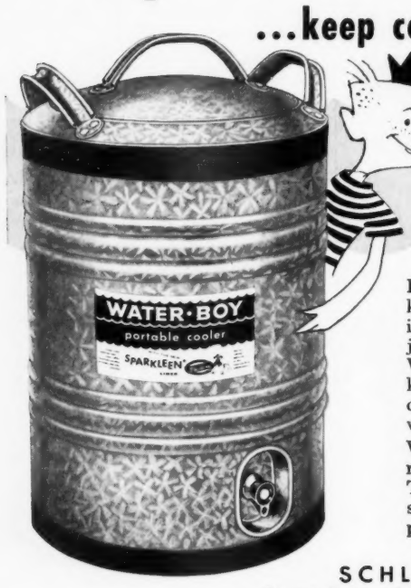
OTHER PRODUCTS OF STANDARD STEEL
ASPHALT DISTRIBUTORS . . BURNERS . . POWER AND TRACTION DRIVEN CONSTRUCTION BROOMS . . . MAINTENANCE DISTRIBUTORS . . . TAR KETTLES . . AGGREGATE SPREADERS STREET FLUSHERS PIPE LINE EQUIPMENT . . SUPPLY TANKS SHELVING HARDWARE AND AGRICULTURAL EQUIPMENT

Built to the Highest Standard

Standard Steel Works, Inc. NORTH KANSAS CITY, MO. SJ7

For more facts, use Reader-Reply Card opposite page 18 and circle No. 247

Keep Worker Efficiency Up!
...keep cool drinking water on the job with



WATER BOY
portable water coolers

Keep workmen on the job by keeping sparkling pure, refreshingly cool drinking water on the job. Efficiency goes up when Water Boy Portable Coolers are kept handy on every type of construction and maintenance work.

Water Boy Coolers are big, rugged, built to take abuse. They feature double-locked seams and bottoms, brass-nickel plated recessed faucets, fully enclosed or open-rimmed covers. There's the new SPARKLEEN liner, too, that keeps water sparkling clean, odor-free and taste-free.

You'll find Water Boys are a money-saving investment everywhere they're used.

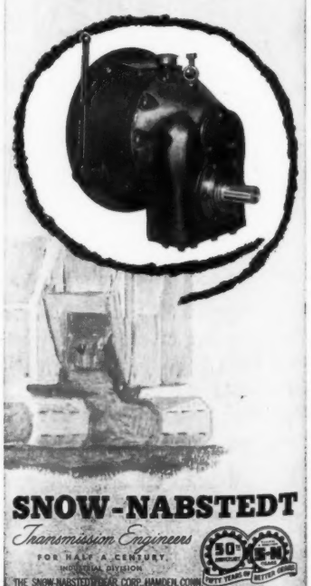
QUALITY HEAVY METALWARE Deluxe SCHLUETER MFG. CO. ST. LOUIS, MO.

SCHLUETER MFG. CO., ST. LOUIS 7, MISSOURI

For more facts, use Reader-Reply Card opposite page 18 and circle No. 248

Longer Work Time Keeps Your **Profits...UP** with

S-N
REDUCTION GEARS



POWER A DIESEL OR GASOLINE INDUSTRIAL ENGINE with S-N REDUCTION GEARS and Power Cut-Off Clutch

Regardless of the type of heavy duty equipment you are powering . . . there's a S-N Model and gear ratio to do the job — faster, and more economically. Seven models available. Remember S-N Reduction Gear Units insure smooth, full power from engine to load with maximum economy. Ideal for original equipment and all types of engines from 40 H. P. to 750 H. P. giants. Reduction ratios start at 1.5:1 and step-up to 4:1 in standard ratios. New catalog sheets are available.

SNOW-NABSTEDT
Transmission Engineers
FOR HALF A CENTURY
INDUSTRIAL DIVISION
THE SNOW-NABSTEDT GEAR CORP., HAMDEN, CONN.
50 FIFTY YEARS OF MOTION AHEAD S-N

For more facts, circle No. 315

personal pride in his safety program and in his jobs. One in particular was exceptionally gratifying. It came up after a railroad company demanded $6 million in compensation for a piece of track that was to be abandoned because it fell within the limits of a reservoir being constructed by the Corps of Engineers. The Corps thought the demand unreasonable, but wanted an estimate by an expert.

Barber was called in, he studied the section carefully, then reported that he thought the section could be replaced for $3.5 million. Bids were taken for the replacement, and the work was actually completed for just a little less than the amount of Barber's estimate. Barber's fee of $100 per day for his services was a good investment for the Corps, but the cash meant much less to Barber than the fact that his services had been demanded.

A less profitable experience—but one he still feels worth while—actually had nothing to do with a job. Disagreeing with the President of the United States on one particular matter, Barber spent $149 to send a telegram couched in what he calls "pool hall words" to the chief executive. Then he sent copies to all the senators and representatives in Congress.

The only effect of the message, Barber admits, was a personal visit a short time later by three auditors of the Internal Revenue Department. They went through his records with a fine comb and decided he should pay $6,200 more in income tax. Barber's still glad he sent the telegram.

Stays close to jobs

The firm today owes much to all the knowledge and experience Barber gained since the time he first started working on bridges at the age of 14. Then, with only 14 months of formal schooling, he joined the bridge department of the Frisco railway as a laborer. Already interested in railroads, bridges, and construction, he spent 12 years with the Frisco and Missouri Pacific railroads, learning skills needed in various phases of bridge building, before taking a job with List & Weatherly's bridge crew. Then, in the short pace of a year, he worked himself up to superintendent of the crew. In the 14 years he spent with the firm, Barber supervised construction of numerous bridges and other projects in the south and southwest, building up a solid foundation of practical knowledge for supervising the work of his own firm later on.

Sons help run firm

Barber is still the president of his own firm today, but his three sons, E. E. Jr., Stanley, and Larry are all active in the business. Two daughters, Mrs. Margaret Miller and Mrs. Barbara Ann McKever are among the stockholders, while a niece, Miss Newrany Lambert, is secretary-treasurer of the firm.

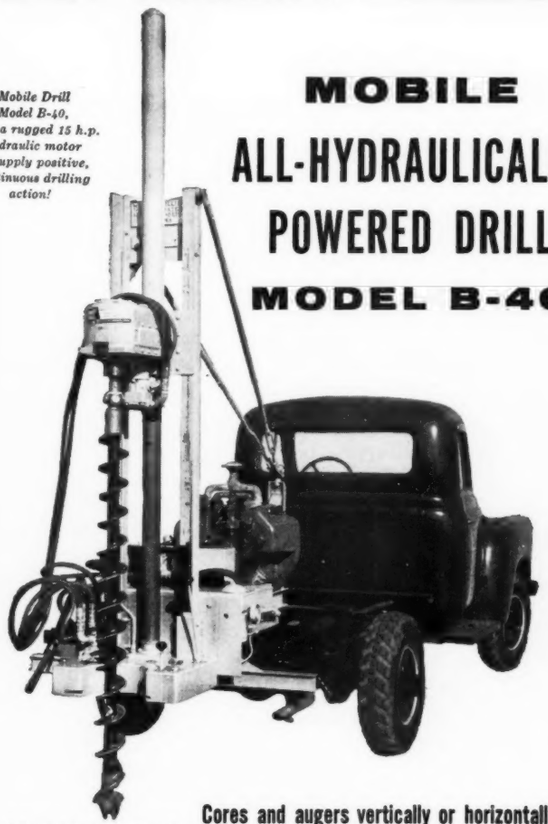
Miss Lambert handles the office while the men spend most of their time out on the jobs. The sons figure, bid, and run their own jobs with only a minimum of assistance from

(Concluded on next page)

New! Versatile! Portable!

MOBILE ALL-HYDRAULICALLY POWERED DRILL MODEL B-40

Mobile Drill Model B-40, with a rugged 15 h.p. hydraulic motor to supply positive, continuous drilling action!



A COMPLETE LINE OF MOBILE DRILLS

INVESTIGATE!

MODEL B-27
● Light! Powerful! Field proven for exploratory work in unconsolidated formations. Mounts on Willys vehicles P.T.O. driven. America's most outstanding light, portable rig.

MODEL B-35
● A convertible drill for vertical-horizontal work, featuring a new safety hydraulic clutch. Willys mounted, operated by P.T.O.

MODEL B-36
● A tough, portable rig for heavier formations and P.T.O. operated. Mounts on any 4-wheel drive International or Dodge Power Wagon.

MODEL B-52
● Heavy-duty! Operated by Ford Industrial Power Plant. Built to withstand terrific torque of toughest formations. Adaptable to a really extensive list of uses.

Cores and augers vertically or horizontally. Brings economy to under-highway boring.

Light, powerful, low-cost drilling . . . yours, with the new Mobile Drill Model B-40. This one-man-operated rig easily mounts or dismounts on the front, rear, or side of *all* vehicles, including wheel or crawler tractors. Cores with air *or* water to 200', augers to 75' in *minutes*. The B-40 quickly converts to *any* degree in a 360° angle, cuts costs on underground water, gas, and power-line installations. Light enough for air transport to remote areas, powerful enough for a complete range of tough exploratory jobs. Never before has such a LOW COST drill with such amazing power and versatility been offered. Write, 'phone, or wire today for complete information!

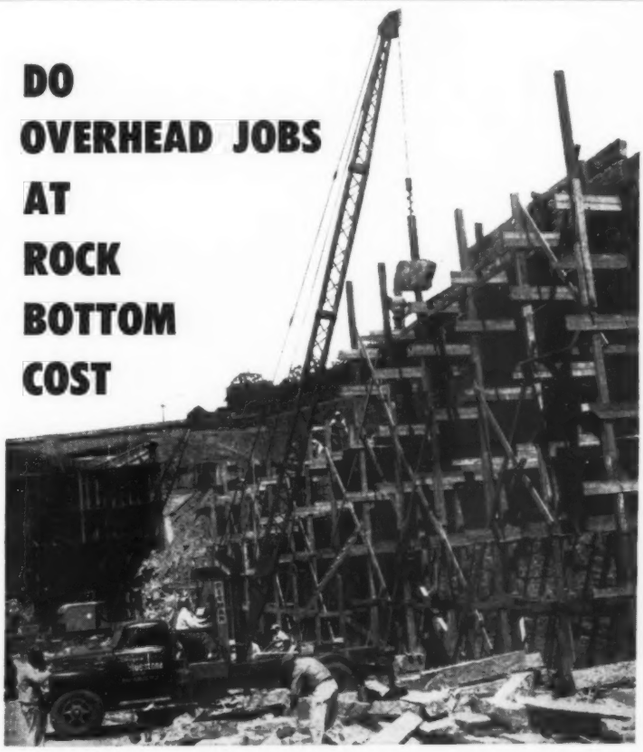
MOBILE DRILL

MOBILE DRILLING, INC. • 950 NORTH PENNSYLVANIA STREET • INDIANAPOLIS 4, INDIANA

World's Largest Manufacturer of Light Vehicle Powered Drills

For more facts, use Reader-Reply Card opposite page 18 and circle No. 249

DO OVERHEAD JOBS AT ROCK BOTTOM COST



with the amazing

Pitman CRANE MODEL 80

- Capacity Up to 4 Tons
- Boom Lengths to 59'
- 180° Power Swing
- Mounts on Conventional Trucks
- Boom Folds Like Carpenter's Rule
- Precision Boom and Loadline Control

With Pitman Crane, Model 80, you now can do scores of jobs that formerly required a crane costing thousands of dollars more. And, because you can move it to the job and set it up so quickly, Pitman Crane does many of these jobs much faster, much easier. Get all the facts NOW! Pitman Crane could save you thousands of dollars in one season alone.

Pitman MFG. CO.

300 West 79th Terrace
Kansas City, Mo.

Send me complete details on the new Pitman Crane, Model 80, along with name of nearest distributor.

Name _____

Company _____

Street _____

City _____ State _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 250

portrait in print

their father.

Barber practically lives on the job. He gets a hotel room as close as possible to headquarters, and that room becomes both home and office for the duration of the job. Most of each day, he spends personally supervising operations at the work site. He never lets a steel erection job go by without taking a hammer and actually driving some of the rivets. He claims to have driven rivets every year since 1912, and he defies inspectors to find loose rivets among those he drives. Barber does most of his bidding right from the hotel room near the job he is supervising. In one evening—or more accurately one night—he may completely figure a bid on a millon dollar job.

"Mom runs the house," Barber says in his characteristically clear and concise way, whether he is in the field or not. "Mom" refers to his wife, Mrs. Barber, and "the house" refers to a modern "push-button" home in Fort Smith, Ark.

Barber's success, despite some of the most forbidding economic hazards, is like a Horatio Alger story. Yet even today, the man who spent $149 to send a telegram to the President calls everyone else by their first name and answers to the initials "E. E." or the nickname, "Barb". Barber doesn't mind. "I don't think there's too much in a name anyway," he says. "What counts is to get up earlier, work harder, think deeper, and stay a little longer." That's what Barber's done all his life. THE END

Air compressors, pumps

■ A line of air compressors, pumps, and paint-spraying equipment manufactured by Saylor-Beall Mfg. Co. is presented in a catalog from the firm. Compressors described and pictured are single and twin-cylinder portable units and tank units. Other machines covered are paint sprayers, filter and regulator assemblies, and air-powered tree pruners and brush shears. Complete specifications for various models of each unit are included.

To obtain this catalog write to Saylor-Beall Mfg. Co., 401 Kibbe St., St. John's Mich., or use the Request Card at page 18. Circle No. 31.

The 5-gallon Horton Special water cooler.

Water cans and coolers offered in seven sizes

■ Seven models of Horton Special water cans and coolers, ranging in capacity from 1½ to 15 gallons, are announced by Snelling Mfg., Inc., formerly Turner Specialty Mfg., Inc. All models are made of copper-alloy galvanized steel. Standard cans and coolers have dead air space insulation, while the heavy-duty models are fully insulated with ground cork between the inner and outer liners.

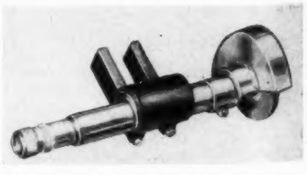
All models come with or without spigot installed. Heavy-duty coolers normally have a close-type lid, and standard models are usually furnished with an open-type lid. Heavy steel hold-down racks, for mounting the cans on truck bodies or running boards, are available in three sizes. The racks are equipped with rubber grommets to protect the cans.

Horton water cans and coolers are available in 1½, 2, 3, 5, 10, 15, and utility 5-gallon sizes.

For further information write to Snelling Mfg., Inc., 5521 Clinton Drive, Houston 20, Texas, or use the Request Card at page 18. Circle No. 93.

New spindle coupled when ready to grind

■ A new type of grinding spindle which is said to be more convenient than a conventional tool post grinder is announced by Wyzenbeek & Staff, Inc. The setup is made with the

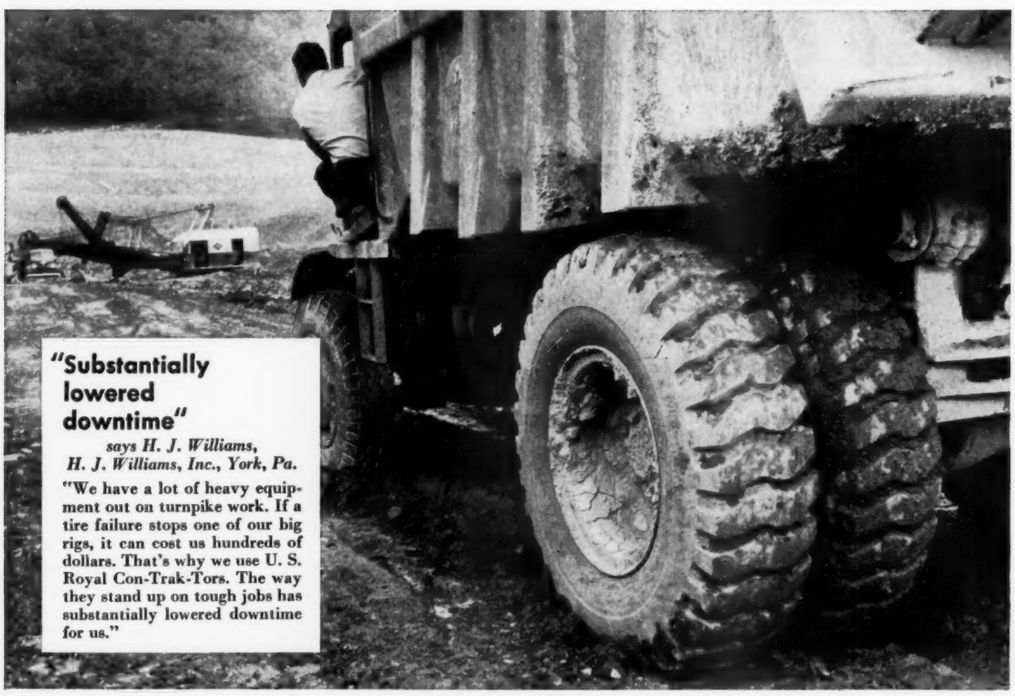


spindle only; the flexible shaft motive power is not coupled up until ready to grind.

The Wyco grinding spindle is available in three sizes to accommodate grinding wheels up to 5 inches in diameter. Each size is equipped with a Wyco quick-change attachment for snapping on and off the shaft of a Wyco flexible shaft grinder.

For further information write to Wyzenbook & Staff, Inc., 223 N. California Ave., Chicago 12, Ill., or use the card at page 18. Circle No. 139.

Costly Downtime Drops!



"Substantially lowered downtime"

says H. J. Williams, H. J. Williams, Inc., York, Pa.

"We have a lot of heavy equipment out on turnpike work. If a tire failure stops one of our big rigs, it can cost us hundreds of dollars. That's why we use U. S. Royal Con-Trak-Tors. The way they stand up on tough jobs has substantially lowered downtime for us."

Approach to south portal of T. J. Evans Tunnel, on the Pennsylvania Turnpike near Allentown.

U.S. ROYAL NYLON CON-TRAK-TOR FULL LUG

If, like Mr. Williams, you use heavy-duty trucks, you can reduce your equipment downtime and your operating cost with the U. S. Royal Con-Trak-Tor. Here is why.

This tire's *Nylon cord carcass* stands up to vicious shocks, fights off sharp rocks and snags. It has *triple impact protection*—extra cushioning rubber between plies, double shockpads under the tread, extra-tough construction at the crown. Its *full-lug traction* pulls right through toughest going, reduces sideslip to an absolute minimum, just won't bog down.

Your U. S. Royal Dealer now has the U. S. Royal Con-Trak-Tor in your size. Have him put it on your wheels—and prove to yourself why men like H. J. Williams report that both downtime rates and operating costs *drop* with this great tire!

US RUBBER **United States Rubber**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 251

New Model 120 excavator mounts on rear of I-H 300 Utility tractor. Angling bulldozer is attached to front of rig.

Backhoe and dozer for wheel tractor

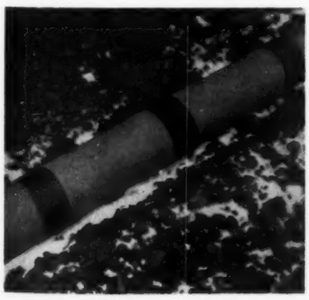
■ A new Pippin excavator and an angling bulldozer for mounting on the International Harvester Co. 300 Utility tractor has been announced.

The Model 210 backhoe excavator digs to a depth of 10 feet and loads to a height of 9 feet with backhoe bucket and 12 feet with shovel bucket. The angling bulldozer features heavy tubular push-arm construction. The blade is available with angling bracket for quick angling 12½ or 25 degrees left or right.

For further information write to Pippin Construction Equipment, Inc., White River Junction, Vt., or use the Request Card at page 18. Circle No. 146.

New plastic clip for drain tile joints

■ A polyethylene plastic clip, developed and manufactured by Boco Industries, Inc., Detroit, Mich., is said to be a cheaper, faster, and more permanent installation than tar paper or other coverings for drain tile joints.



Manufactured of an acid and alkali-resisting plastic, the Boco tile clip has spacing lugs which permit standard ⅜-inch spacing between tiles. A fin on the outer surface acts as a handle and also aids in aligning the tiles.

For further information, write to Boco Industries, Inc., 19424 W. Eight Mile Road, Detroit 19, Mich., or use the Request Card at page 18. Circle No. 120.

Cummins names manager of southwest region

W. M. Steed has been appointed manager of the southwest region of the Cummins Engine Co., Inc., Columbus, Ind. From headquarters in Los Angeles, he will cover the states of California, Arizona, and Nevada.

With Cummins since 1951, Mr. Steed was formerly in Chicago, Ill.

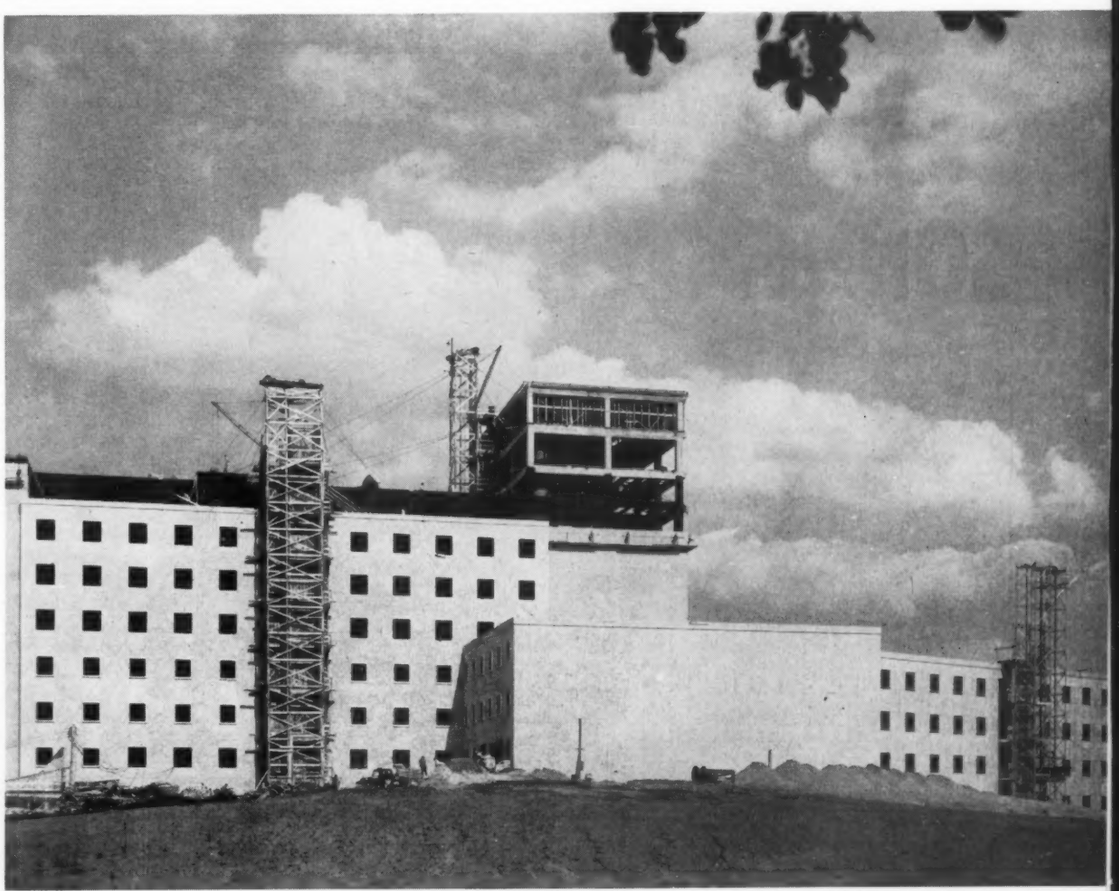
Water, supply tank for construction jobs

■ A portable 5-gallon water and supply tank for construction crews is manufactured by D. B. Smith & Co.

The Smith Model 75G Indian tank is of Armco zinc grip steel construction, and may be carried by hand or strapped to the back. It is suitable for dispensing water and coffee, and for use as a supply tank for heating and combustion fuels and curing compounds.

The tank has a push-button faucet and a 4-inch opening for filling. Its weight is 11 pounds.

For further information write to D. B. Smith & Co., Smith Bldg., Main St., Utica 2, N. Y., or use the Request Card at page 18. Circle No. 126.



100 MILLION POUNDS—STRAIGHT UP!

100,000,000 POUNDS of construction material for the Prudential North Central Office were moved by American Hoists on the job!

Three thousand tons of steel, 20,000 yards of concrete, 42,000 cubic feet of stone—a hundred million pounds! That's the material handled by American General Purpose Hoists during construction of the North Central Home Office of Prudential Insurance. For top flight performance on any hoisting job—handling any material to any height, American Hoists offer precise, safe load control through the smooth action of time tested clutches and brakes. Power flow is smooth, economical because of American's anti-friction, self aligning bearings and machined gears. Rugged American Hoists give you trouble-free service for hundreds of jobs.

Your American Distributor will show you hoists beginning with capacities of 3000 pounds single line pull and up!

AMERICAN HOIST
and Derrick Company
St. Paul 1, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 252

The 300-foot arch of the bridge begins to take shape. Falsework for the arch ring consists of three triple-section wood and steel trusses, fabricated by Timber Structures of California.

Heavy underpinning supports large concrete bridge pours

The need for heavy underpinning to support massive concrete pours that had to be made in confined areas was the biggest problem involved in the construction of the new Dog Creek Bridge carrying U. S. 99 across a steep gorge between Redding and Dunsmuir, Calif. The new 642-foot span, with a 300-foot-long concrete arch, was built by Ukropina, Polich & Kral of San Gabriel, Calif., to replace an old crossing.

The $742,000 structure has a 62-foot 6-inch wide reinforced-concrete deck with 2-foot 9-inch sidewalks on each side. Twin arch ribs carry the deck over the 300-foot-long 75-foot-high arch span, which is located between piers 3 and 4. These arch ribs were constructed separately with one set of falsework. After the first rib had been completed, the falsework was slid across the tower support for the second rib. Running from west to east, the bridge rests on abutment 1, bent 2, pier 3 and 4, bents 5, 6, and 7, and abutment 8.

The piers are tall reinforced-concrete shafts, battered slightly to give pleasing lines. Fourteen-inch OD cores formed with Sonovoid tubes were used in span 7 to reduce the dead load. Making construction of the bridge even more complex was the fact that the deck rises on a uniform 4.50 per cent grade, and that part of the structure is on a 1,400-foot radius curve. On this curved section, the deck is superelevated to make traffic flow smoothly around the west end of the structure.

Quantities in this job included 2,100 cubic yards of stripping, 3,400 cubic yards of structure excavation, 1,260 cubic yards of Class A portland-cement concrete in the arch rib, 6,600 cubic yards of Class A portland-cement concrete in the remainder of the structure, and 1,160,000 pounds of reinforcing steel. A total of 91 steel H-piles, totaling 1,400 linear feet, was also required.

Tough pioneering

The first problem faced by UPK was the pioneering of access trails down the steep gorge so that excavation for footings could begin. This tough job was done by a Caterpillar D8 and dozer, which also excavated for footings over bedrock wherever possible. Another D8 with a Hyster rear-mounted backhoe handled the remainder of the latter work.

The 91-unit steel H-beam pile-driving job was subcontracted to Raymond Concrete Pile Co., which

NOW...WHEN POURING CONCRETE—

Drastically reduce costs of your plywood forms with

SONNEBORN FORM-SAVER

FORM-SAVER REDUCES COSTS. HERE'S WHY:

- **Gives maximum protection** of wood forms with a minimum of labor. Just brush it on or dip forms into it!
- **Provides 8 to 10 re-uses** from your forms before re-coating with Form-Saver!
- **Produces clean, smooth concrete surfaces** that show no wood grain . . . that require little, if any, rubbing except for fins and butt joints.
- **Reduces painting costs.** There are no oil stains to remove . . . paint goes further, is easier to apply due to smoothness of surfaces. Form-Saver helps reduce the cost of painting by as much as 25%!

Sonneborn Form-Saver is a fast-drying coating that deposits on plywood forms a water-impervious film resistant to the alkalinity produced by the hydration of portland cement.

For further information on Sonneborn Form-Saver FILL IN THE COUPON

A Product of Sonneborn RESEARCH

Makers of Lapidolith Concrete Hardener
Hydrocide 5•X Colorless • Hydrocide Dampproofings

L. SONNEBORN SONS, INC.
Building Products Division—Dept. C-4
404 Fourth Ave., New York 16, N. Y.

Gentlemen:

Yes, I would welcome a free copy of Technical Data Guide No. 48 on Sonneborn Form-Saver.

Architect ☐ Engineer ☐ Contractor ☐

Name.....

Company.....

Location.....

City.....State.....

For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 253

Logs used as shores reach 75 feet from stream bed to pour; 300-foot-long arch section has falsework support at four points

Concrete delivered by Challenge mixer to a Brown-Bevis stationary hopper is brought to a deck pour by Whiteman power buggy. Other pours on the bridge were handled by crane and bucket.

rented a crane locally and used one of its own pile hammers and a small upright steam boiler for this work.

Construction of footings, two of which contained more than 1,000 cubic yards of concrete, was a routine operation. Since most of the exposed faces of footings were buried behind backfill, only the size of steel and concrete work caused any problems. Concrete was bucketed to these pours by either a Unit crane with a Gar-Bro 1-yard bucket, or a Manitowoc 2½-yard machine handling the same type of bucket. Concrete was supplied from Oaks Sand & Gravel Co., Redding, Calif., in Challenge truck mixers.

Heavy forming, underpinning

The size of the bridge, coupled with the steepness of the canyon, made it necessary to use heavy underpinning, together with forms that would stand up under great stresses.

All underpinning that supported bridge pours from below consisted of native trees, cut to exact dimension and scabbed together every 15 to 20 feet to reach from the stream bed or canyon walls to the concrete pour. These supports were erected in the form of bents. The first two spans, reaching from the south bank to Pier 3, contained 14 such bents, each of which had 12 vertical members. The bents were capped by 12×12 structure-grade fir. Above them were variable uprights, of the same dimension, which met the underside of the deck. The load was distributed longitudinally by 12 heavy steel 16-inch-wide flange beams, running with the bridge deck, which rested atop the uprights. The entire forest of underpinning was heavily sway-braced by 3×8 fir timber.

Perhaps the most unique underpinning was that beneath the concrete arch section. Falsework for each arch had four principal points of support. The ends rested on a heavy H-beam frame, cast into the lower part of the pier concrete. Two framed towers supported the center section. These consisted of eight timber uprights squared and joined by metal straps at 15-foot intervals. Heavy timber spreaders between the upright members, with steel rods arranged as X-bracing, made the support structure rigid. Steel H-beams capped off the top of the upright system.

Falsework for the arching con-

(Concluded on next page)

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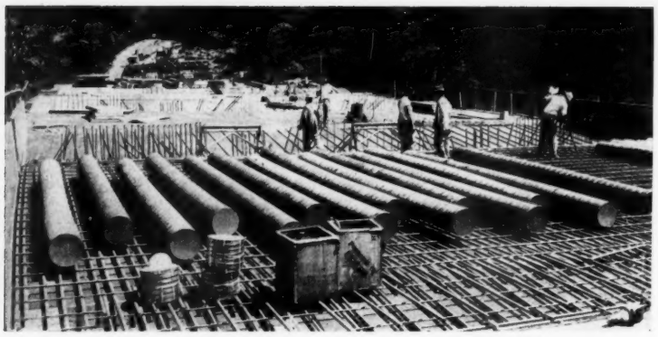


Sonovoid tubes are being used in span 7 to reduce the dead load of the deck. The 62½-foot-wide deck, about 150 feet above the surface of the creek, will have 2-foot 9-inch sidewalks.

(Continued from preceding page)

sisted of three triple-section wooden and steel trusses, fabricated for the project by **Timber Structures of** California, Inc. These trusses consisted of two end sections and a center piece, the ends of which rested on the underpinning provided. Joists on 6-inch centers were laid over the trusswork to form the support for the plywood forms of the concrete arch.

Plywood facing was used for the bridge superstructure, since almost all of it is exposed to view. The column forms consisted of prefabbed panels of plywood with 2×4 or 2×6 studs, and wales. Burke form hardware was used on columns and at other points, and for safety's sake, form bolts up to ¾ inch in diameter were generally spaced close together.

A complete line of power saw equipment, assembled and set up in a central yard at the administrative headquarters at the west end of the job, was used to fabricate the forms. This equipment included DeWalt cutoff saws, bandsaws, and various jointers.

Concrete batching subbed

Oaks Sand & Gravel Co., subcontractor on concrete batching, used a highly efficient portable batcher that turns out concrete at speeds up to 36 cubic yards per hour. Two principal methods were used to place concrete, which was hauled to the bridge by Challenge truck mixers.

A Gar-Bro transfer bucket took concrete from truck mixers and delivered it to columns and other pours impossible to reach with power buggies. A Manitowoc crane with 131-foot boom and 13-foot jib handled this bucket part of the time, and a smaller Unit crane mounted on top of the structure placed the balance of the concrete. Because of the steep terrain, there were only a few places where concrete could be placed directly from truck mixers.

Another method of concrete placement was used on the deck. Challenge truck mixers, arriving at the bridge, backed up a timber ramp and dumped their loads to a dual set of concrete transfer hoppers made by Brown-Bevis Equipment Co. Two Whiteman power buggies then hauled concrete to the point of placement, where Homelite electric generators and high-cycle vibrators consolidated the material. Concrete was cured by water.

The bridge was designed by the California Division of Highways, which has F. W. Panhorst as assistant state highway engineer for bridges, and George T. McCoy as state highway engineer. Supervision at field level was under resident engineer N. E. Spickelmire for the state, and Victor Weidmer, general superintendent for Ukropina, Polich & Kral. THE END

Power grader rake

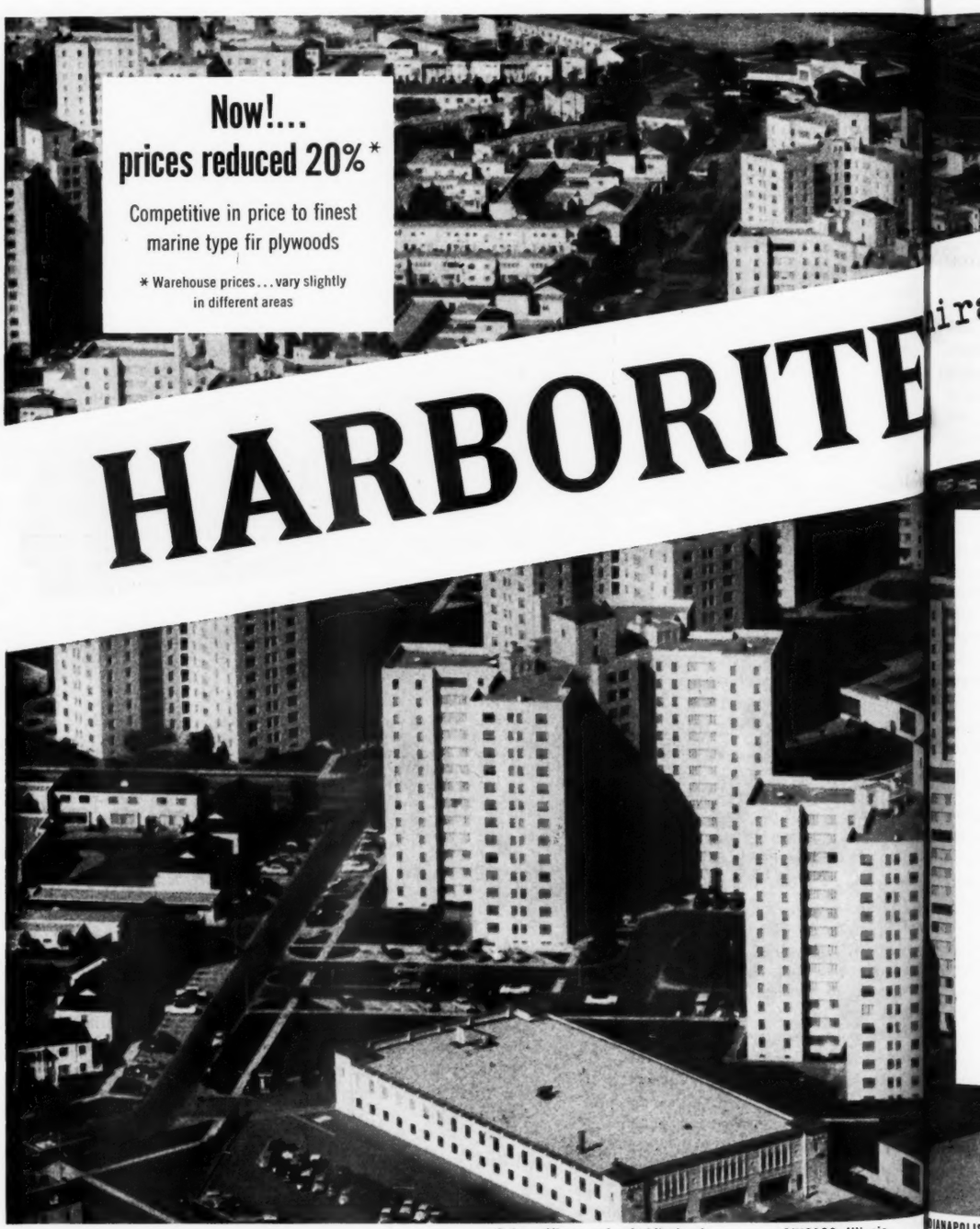
■ A rake that may be used with a power grader or drawn by a truck, tractor, or jeep is described in a folder from York Modern Corp. The rake comes equipped with pneumatic-tire wheels and a locking device that holds it in a raised or lowered position. The Model RA with hydraulic controls and the Model RB with manually operated levers are pictured. Action shots and specifications are included.

To obtain this folder write to York Modern Corp., Unadilla, N. Y., or use the Request Card at page 18. Circle No. 51.

Atlantic Refining names new sales manager

William N. Ruppel has been appointed manager of asphalt sales for the Atlantic Refining Co., Philadelphia, Pa., to succeed the retiring R. S. Townsend.

With Atlantic since 1939, Ruppel served most recently as national accounts salesman in the motor fuels section. Frederick C. Bowman will succeed him in that post.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Improved microphone for mobile radio setup

■ The first transistorized microphone designed specifically for use in two-way mobile radio communications on extensive construction projects and other operations has been announced by the Radio Corporation of America.

The new CX-50 is interchangeable with conventional mobile carbon microphones now in use, and is said to provide appreciable improvement in the intelligibility, voice quality, and reliability of mobile radio communications. It also minimizes the possibility of noise pickup in the microphone cable, according to the manufacturer.

The microphone is styled with an elongated, tapering handle which nestles in the palm of the hand and raises the mouthpiece above the cupped fingers. A positive-action push-to-talk trigger bar is centered in the handle for either-hand operation. The unit is 6½ inches long, 2 11/32 inches wide, and 1 11/16 inches deep, and weighs only 9 ounces. It is delivered complete with a 65-inch cable, which is self-coiling to 18 inches.

RCA's new transistorized microphone is said to appreciably improve voice intelligibility in two-way mobile radio operation.

For further information write to the Radio Corporation of America, Building 15-1, Front and Cooper Sts., Camden 2, N. J., or use the Request Card at page 18. Circle No. 88.

Tamping rollers

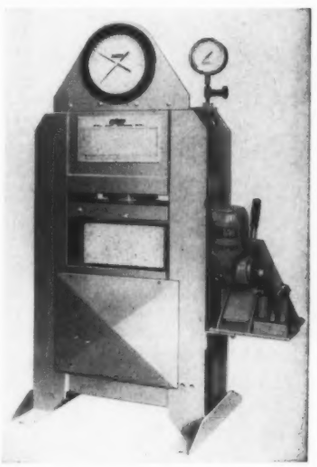
■ Fas-Tamp rollers with single, double, or triple heavy-duty rollers for use with International TD-14, TD-18, and TD-24 tractors are presented in a mailing piece from Allied Tractor Equipment Co. Drums oscillate freely and independently—up or down—and are said to give equal compaction on varied contours. The specification chart gives the size of each model and its components.

Tc obtain this mailing piece write to Allied Tractor Equipment Co., 2917 E. Marginal Way, Seattle 14, Wash., or use the Request Card at page 18. Circle No. 52.

Compression tester for concrete masonry

■ A spherically-seated upper platen which conforms to ASTM specifications is the major feature of the new Model OC-225 compression tester announced by Forney's, Inc.

The unit has a capacity of 200 tons ram pressure, and will handle all concrete masonry units measuring up to 12 × 12 × 18 inches. An extra spheri-



cally-seated upper platen which also conforms to ASTM specifications allows the tester to handle 6 × 12-inch cylinders. The upper platen assemblies are quickly interchanged.

The small gage is a certified test gage used only for checking the accuracy of the work gage. The dual manual and electrically operated pump ensures load application at a constant speed, according to the manufacturer. The 12-inch-diameter work gage dial is calibrated in total platen pressure and seven direct-reading psi scales, so that calculations for conversion to psi are unnecessary.

For further information write to Forney's, Inc., Tester Division, Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 64.

Cast iron parts repair

■ Two types of welding electrodes, Ni-Rod and Ni-Rod 55, for repairing pumps, graders, cylinders, or any other cast-iron machinery or parts are detailed in a bulletin from International Nickel Co., Inc. According to the bulletin, both welding electrodes are 14 inches long and are available in four standard diameters from 3/32 to 3/16 inch.

To obtain this bulletin write to International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., or use the Request Card at page 18. Circle No. 102.

iracle concrete form panels
may be re-used 125 times!
This overlaid fir plywood...proved lowest cost re-use concrete form material
Harborite is ideal for heavy construction concrete work. Resin-impregnated sheets are permanently bonded to the solid wood core . . . providing a smooth, long-wearing, abrasion-resistant surface that's 100% waterproof. The overlaid faces will not run, bleed or discolor concrete and have a special affinity for oils and other form finishes. High re-use factor (50 re-uses are common, 125 re-uses are not unusual) assures important savings. Available in over-size panels and standard 4'x8' size in any thickness.
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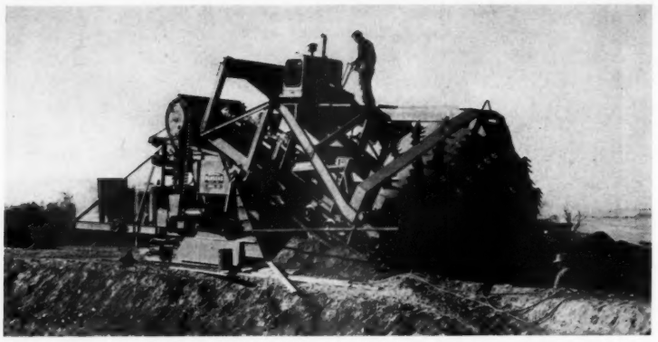
Excavating equipment cuts canals to exact dimension



The cone cutter on this Parsons 310 Trenchliner brings a 2-foot-bottom canal to proper grade in one operation. The cutter is mounted on a common driveshaft in two halves, so that it clears the bucket line.

The job of excavating small canals and getting them precisely trimmed in one operation is being done by a cone-type excavator, mounted on a Parsons 310 Trenchliner, on the 17-mile Texas Hill Canal and Distribution System now nearing completion near Tacna, Ariz.

About 4½ miles of this project consists of a 5-foot-bottom-width canal with 1¼ to 1 side slopes and a 2-inch-thick portland-cement concrete lining. The remainder is a 2-foot-bottom canal, also with 1¼ to 1 side slopes, and a 2-inch concrete lining.

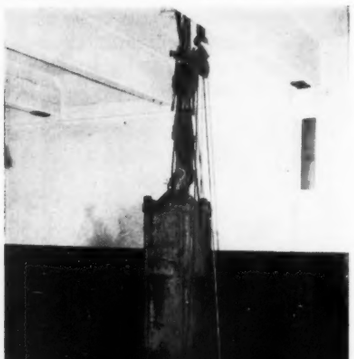
Both new equipment and the good use of conventional equipment, have made it possible for Vega Engineering & Grading Co., Berkeley, Calif., to keep this $1,520,000 USBR job well ahead of schedule. Located near the eastern end of the main Wellton-Mohawk canal, the project, started September 18, 1955 and expected to be finished this June 30, will bring Colorado River water to irrigable lands about 55 miles east of Yuma.

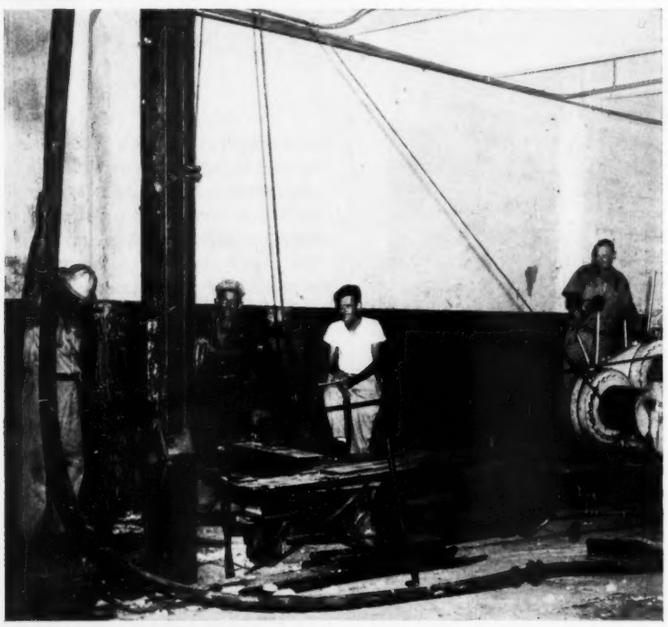
Good preparatory work helped move other phases of construction along. Vega's Roy Chinnici, formerly a top superintendent with United Concrete Pipe Corp., brought in a Caterpillar No. 12 motor grader to clear sparse desert brush from haul-road locations and to rough in necessary grading. Careful work on the haul roads made it possible for all the equipment to get around rapidly and deliver loads without getting stuck or losing time.

Another important piece of equipment was the Southwest 6,000-gallon water tanker, towed by a Euclid tractor. Grading, smoothing, and watering, together with compaction delivered by the pneumatic tires of both rigs, helped establish proper haul roads before other equipment moved in.

Large canal excavation

Since the canal system lies in a valley having soil suitable for farming, tractor-type dirtmoving equipment was used for the larger canals. One-way hauls were short, generally under 700 feet. The 16-unit equipment fleet consisted of Caterpillar D8's, and Caterpillar, Wooldridge, or LeTourneau scrapers. Three Caterpillar DW21's handled some limited long-haul work. A Caterpillar No. 12





A new $7,000,000 six-story court house and jail was to be built for Duval County, Florida. The contractor, The George D. Auchter Company of Jacksonville, had to obtain test pile information to determine subsurface conditions prior to the demolition of an existing building on the site.

It looked like a tough job, but it didn't feaze the contractor's organization—they had successfully handled similar jobs requiring foundation tests inside buildings.

A Tough Driving Job

accomplished with the help of a McKiernan-Terry Pile Hammer

Mr. A. W. Avent, Vice President of Auchter, reports that the job was accomplished by driving 4 test piles by means of a McKiernan-Terry 9B3 Double-Acting Pile Hammer which, incidentally, had given good service ever since it was purchased in 1946.

The illustrations show, top to bottom, the McKiernan-Terry Hammer on the third floor of the existing building, the control leads from the winch on the second floor, and a portion of the test piling as it goes through the ground floor.

You, too, can depend upon McKiernan-Terry pile-driving equipment for successful results on your own pile-driving jobs. Write for bulletins describing the extensive McKiernan-Terry line of pile hammers, pile extractors, pile hammer leads and accessories.

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Rigs are adapted for work on 5 and 2-foot-bottom canals; well-planned preparatory work speeds excavation, and 2-inch concrete lining

A Guntert & Zimmerman power trimmer, riding on rails on each side of the canal berm, trims the 5-foot-bottom canals. The rig is equipped with H & L teeth and is powered by a Cat D13000 diesel engine driving a 75-kw generating set.

motor grader was used to spread excavated material, and a Southwest 6,000-gallon water truck, mounted on a Euclid, supplied water from nearby irrigation canals. This transport was loaded by a Rex 4-inch centrifugal pump.

The main function of the Cat and scraper fleet was to build up areas where the canals were to be raised above normal ground level. The scrapers also made the initial pass to start the excavation of the larger canals in a few places.

For the most part, excavations for the large canal sections were roughed in either by a Bucyrus-Erie 38-B dragline with a 1½-yard Hendrix bucket or a Lorain 2-yard machine with a Hendrix bucket.

A Guntert & Zimmerman power trimmer is completing excavation of the large canals, getting the sides and bottoms to exact grade lines. This machine operates just ahead of the concrete-lining crew. A railroad rail on each canal berm supports the rig as it moves along, powered by a Caterpillar D13000 diesel engine driving a 75-kw electric generating set. A 30-hp General Electric motor, driving through a Caterpillar D4 gear-reduction box, operates the main digging bucket lines. Bucket teeth are furnished to the job by H & L Tooth Co., Montebello, Calif. The stacker conveyor on this machine is driven by a 7½-hp electric motor, and 1-hp motors operate the driving wheels. This trimmer makes between 1,500 and 2,000 feet in a 24-hour run as it pulls about 12 inches of material off the canal sides and bottom.

Excavation for small canals

A machine not used on the Wellton-Mohawk system before—a cone cutter that shapes side slopes properly—is removing dirt in the small 2-foot-bottom canals. The cutter itself is mounted on a conventional Parsons 310 Trenchliner.

The endless bucket chain on the Parsons Trenchliner picks up dirt that has been dislodged from the slope prism by the revolving cone cutter. The cutter is mounted in two halves on a common driveshaft and is strengthened by outboard bearings at the ends of its supporting outrigger. This mounting enables the cutter to clear the sides of the bucket line. An

(Continued on next page)

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 257

Concrete mixed by the Worthington-Ransome 34-E and dumped to the Gar-Bro 1-yard bucket, is transferred to the slip-form paver by a Bucyrus-Erie 38-B crane. The self-powered slip-form rides rails placed on the berm.

on a materials supply basis by Yuma Sand & Rock Co., Yuma, Ariz., which moved a small commercial plant to the job to produce the material. The plant consists principally of vibrating screens, a sand washer, and aggregate-washing equipment. Aggregate produced is trucked to the contractor's batch plant and dumped in three piles. The sand, pea gravel, and coarse rock from these piles is shoved to a trap by a D6 with dozer and an Allis-Chalmers tractor-shovel.

The concrete batching plant, originally shop-assembled by United Concrete Pipe Corp., then sold to Ukropina-Polich-Kral, was purchased by Vega for the Texas Hill job. After the sand and rock has been routed over vibrating screens, an elevating stacker conveyor brings the material from the feeder trap to plant bins.

Bulk cement is being transported to the job from the Tucson headquarters of Arizona Portland Cement Co. There is field storage for about 1,500

(Continued from preceding page)

outrigger and heavy concrete counterweight blocks at the front of the machine counteract the weight of the heavy cone cutter at the rear.

This machine, trimming small canals in one operation, digs about 150 feet per hour in either cuts or built-up sections.

Concrete lining

The placement of the concrete lining is being done with virtually an assembly-line technique. A large Guntert & Zimmerman slip-form liner is being used on the 5-foot canal section, and a similar but smaller liner is being used on the 2-foot-bottom canals.

The first machine in the train is a Worthington-Ransome 34-E paver, supplied with water by a 4,000-gallon trailer. A Bucyrus-Erie 38-B crane with a Gar-Bro 1-yard transfer bucket, the slip-form paver, and a curing bridge complete the lineup.

The 1-cubic-yard batches being turned out by the paver go to the Gar-Bro bucket, which dumps directly to the small electric-powered traveling spreader that moves across the top of the slip-form. Ten delivery chutes train the material to the base of the slip form, where surface vibrators consolidate the concrete as the machine moves along. Durair air-entraining solution used in the mix is making the concrete very workable, even though it contains 1-inch aggregate.

Like the trimmer, the slip-form is powered by electricity generated by its own diesel-electric set. Railroad-type wheels at all four corners support the rig. A hydraulic jack adjustment at each corner makes it possible to keep the machine level and running to true grade.

Five cement finishers with steel trowels work behind the slip form, putting finishing touches on the concrete. A transverse contraction joint is cut into the concrete at 10-foot intervals, so that cracking due to shrinkage will be controlled. Sealtex white pigmented concrete curing solution is being applied to the fresh material by a hand-held spray and compressor from the curing bridge.

Sand and aggregates for the 13,365-cubic-yard concrete job is being done

Bigger Capacity...

This new, 1956 model HO "PAYLOADER" has a bucket capacity of 2¼ cu. yd. payload, 1¾ cu. yd. struck . . . is the biggest-capacity "PAYLOADER" ever offered, and outstanding by any measure. Pound for pound, it's ahead of the field in digging power and carrying capacity. It's more maneuverable, faster operating, easier operating, easier riding—with or without load—than anything near its size. It delivers better, more reliable traction over a wider range of ground conditions than any wheeled tractor-shovel *ever* has. It has balanced design and durability *throughout* to deliver big yardage day after day without interruption.

barrels of cement at the site, and before the job is finished a total of 20,000 barrels of the material will have been used.

The fleet of batch trucks hauling to the paver consists of six late-model Macks, each of which carries four dry batches. The entire project, spread over a wide area, is being coordinated by the use of a Motorola two-way radio system.

Thanks to good early planning—which made the jobs of excavating and paving crews easier—and the use of machines that are quickly and accurately performing the work required, Vega will have the entire system completed within another two months, well ahead of the time originally allotted.

THE END

Hints on drafting

■ Eleven ways to save drafting time by using intermediates to make quick modifications of drawings without changing the original are compiled in a booklet from the Frederick Post Co. Every step of the process—scissor editing, masking, the blockout method, successive additions, and preprinting—is described and illustrated. Other methods shown are transparent matte tape, pick-off transfer, composite grouping and overlays, non-reproducible blue, and the use of corrector fluids.

To obtain this booklet write to Frederick Post Co., 3666 N. Avondale Ave., Chicago 18, Ill., or use the Request Card that is bound in at page 18. Circle No. 26.

The Sterling drum lift permits one man to handle steel drums of up to 55-gallon capacity.

One man handles drums with this new lift

■ An improved drum lift which enables one man to handle steel drums of up to 55-gallon capacity has been announced by Sterling, Fleischman Co., Broomall, Pa. The lift is also recommended for use in handling fiber drums and other containers.

Featuring all-steel construction, the Sterling drum lift is rated at 750-pound capacity. Lifting power is supplied by a foot-operated hydraulic jack. Drums can be raised for pouring to a height of 53 inches, and may be stacked two-high vertically. The center of gravity of the drum is always maintained within the four casters, reportedly making it impossible for the lift to overturn.

An outstanding feature of the lift is the easy-lock girdle which grips the drum firmly, is attached in a matter of seconds, and permits 360-degree drum rotation. Brakes on the drum-lift arm hold the drum at any angle.

For further information write to Sterling, Fleischman Co., Broomall, Pa., or use the Request Card at page 18. Circle No. 60.

New formula stops rust, prepares metal for paint

■ When applied on rusted surfaces, a metal treatment called Ospho stops rust action and at the same time prepares the metal for paint, according to an announcement from the Rusticide Products Co., Cleveland, Ohio. Because this new formula reportedly changes rust (iron oxide) to iron phosphate, paint subsequently applied is said to adhere so tightly that moisture cannot penetrate through to the metal.

The company claims that the use of Ospho saves hours of time spent preparing machinery for painting. Scraping, flame-cleaning, and sand-blasting are unnecessary. All that need be done is to wire-brush loose rust and scale off the metal surface. Ospho then is brushed or sprayed on.

Ospho is available in one-gallon bottles, 10-gallon kegs, and 50-gallon barrels.

For further information write to Rusticide Products Co., 3125 Perkins Ave., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 107.

HOUGH Design . . Quality . . Value

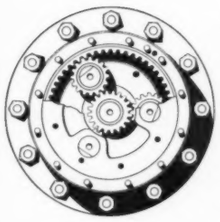
Digging power: Pound for pound, this "PAYLOADER" has more traction and digging power—for a wider range of ground conditions—than any wheeled tractor-shovel ever built.

Hydraulic shock absorber: A shock absorber in the hydraulic system smooths out the ride, permits faster load-carrying speeds over rough terrain—with less spillage.

More production, less effort: Power-steer, power brakes (on all 4 wheels), power shift (no "clutching") and good riding qualities also lessen operator fatigue—promote full production all day.

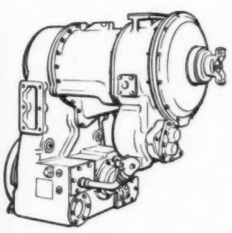
"Stay-clean" hydraulic system: The hydraulic system is closed and pressure-controlled to keep air and dirt from being sucked into the system. This reduces oil foaming, lessens trouble and increases the life of pump, valves, cylinders, rod packings. Both boom and bucket rams are located so as to minimize their exposure to dirt and damage.

Accessible: Unusual accessibility for servicing and maintenance is built into this "PAYLOADER." Battery and oil reservoir are located under an easy-access cover just behind driver's seat. Easy access to engine is possible from either side—and not hindered by boom arms or other structure. "Pick-off" outlet is provided for the easy addition of hydraulically-operated accessories.



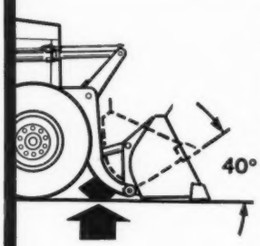
Long-life, high-traction drive train

Heavy duty planetary final drives in the wheel hubs, and hypoid differential gearing, keep torque low in axles . . . prolong life of axles and *all* drive train parts. More effective traction is assured by the use of the model HO torque-proportioning differentials. If one wheel starts to slip, more power is delivered to the opposite wheel. The wheel with the better traction automatically gets up to 24% more torque.



Complete power-shift transmission

The easiest-acting, most effective transmission ever built into a tractor-shovel. *All Shifts* up or down can be made instantly, on-the-go under full engine speed. There's no foot clutch, no stopping for a RANGE shift. The forward-reverse control can also be operated under full engine speed, in any gear, while retaining full bucket action . . . all this, plus torque-converter drive.



Tremendous pry-out action and 40° tip-back at ground level

Special pads are provided on the bottom of the boom arms to give ground support for powerful pry-out action. Load forces are also absorbed by the pads, relieving the axles and wheels of these strains. The bucket can tip back 40 degrees, before raising, to get heaped loads quick and easy even in shallow cuts and low piles, and to retain heaped loads.

Better Performance

If you want the last word in tractor-shovel workability on your jobs, you'll want this husky HO "PAYLOADER". Your Hough Distributor is ready to give you full information.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Send full information on "PAYLOADER" 4-wheel-drive tractor-shovels

☐ model HO—2¼ cu. yd. ☐ model HH—1½ cu. yd. ☐ model HU—1 cu. yd.

Name_____
Title_____
Company_____
Street_____
City_____ State_____

For more facts, use Reader-Reply Card opposite page 18 and circle No. 258

To facilitate moving paving equipment from one strip to another, Lewis & Frisinger Co., contractor on the job, used this low-bed trailer. By ramping up the forms at the end of the strip, paving units can be run onto the trailer.
C&E Staff Photos

Efficient equipment handling expedites airport project

Moving the paving train from one run to another is always a problem for the contractor, but this problem is especially difficult when the runs are very short. In paving small to medium-sized parking aprons at the Wurtsmith Air Force Base, Oscoda, Mich., Lewis & Frisinger Co., Ann Arbor, Mich., simplified and accelerated this operation by using a job-built, extra-long low-bed trailer.

Fabricated of standard beams, angles, and plates welded into a unit, the big trailer rides on four truck wheels equipped with dual tires. The low flat-bed is long enough between the front gooseneck and the rear wheels to accommodate the widest piece of equipment, all of which was extended to span a 25-foot strip. A pair of rails corresponding to the paving forms are adjustable to match the width of the paving strip.

At the end of a run, the trailer is lined up with the forms, and one or two lengths of form are blocked up to provide a ramp matching the rails on the trailer. Each of the paving machines climbs onto the trailer under its own power and is securely blocked in place. A truck or tractor then tows the trailer to the beginning of the next run where a corresponding ramp has been prepared. As the machine rolls off the trailer, it is ready to continue normal operation right away. Transfer from one strip to the next usually can be made without delaying any equipment.

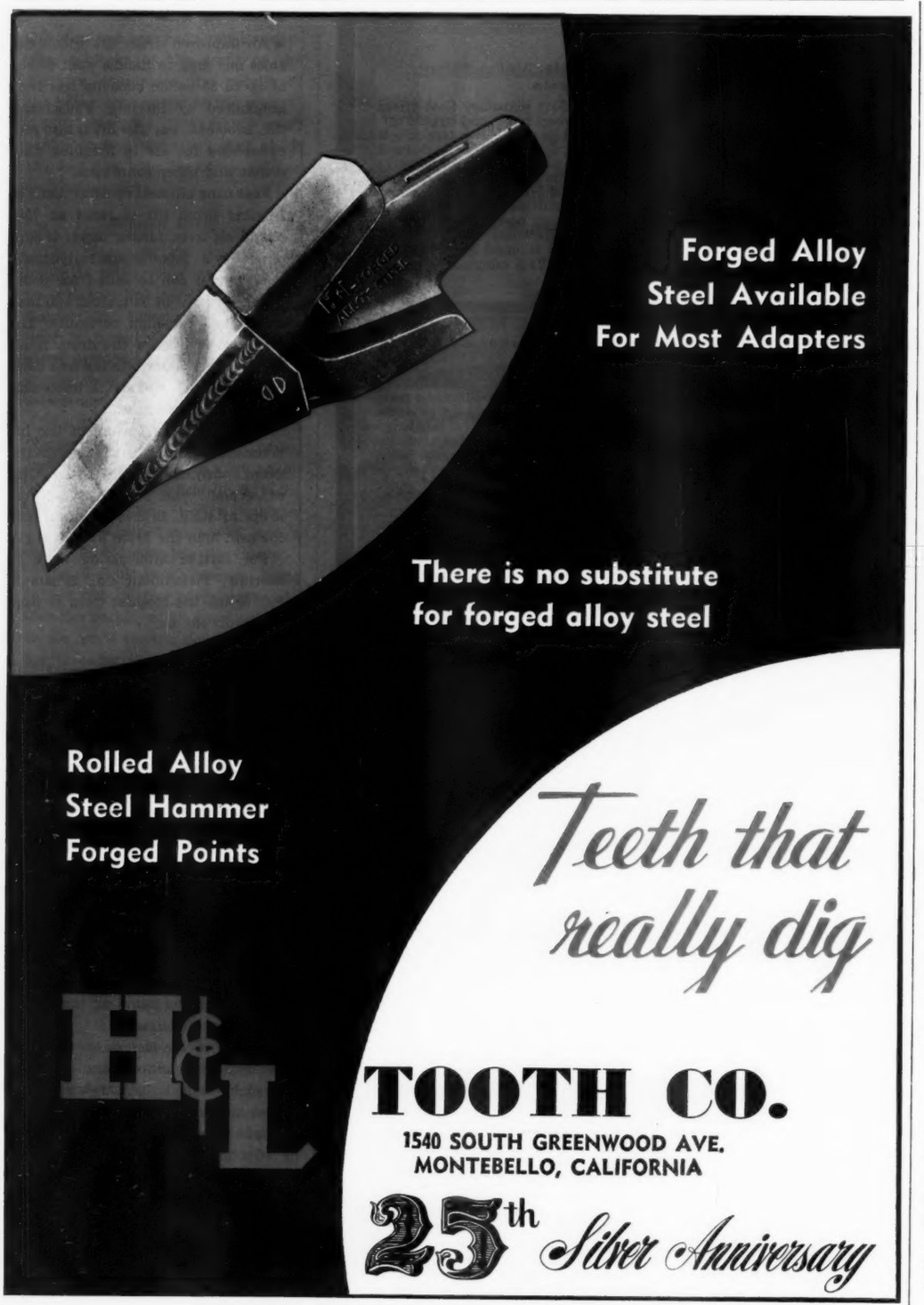
This trailer was first used on the paving of 45,000 square yards of 10 and 14-inch concrete parking apron at the Wurtsmith Air Force Base. The $300,000 apron-extension project was designed and supervised by the Detroit District of the U. S. Army Corps of Engineers.

Since the area had been graded previously, only a minor amount of grading was required before the paving. A Caterpillar D8 tractor with a LeTourneau FP scraper assisted by another D8 with a dozer handled earthmoving operations. Fine-grading was done with a Caterpillar No. 12 motor grader, and the grade was compacted by a Galion 5 to 10-ton roller.

Have new paver

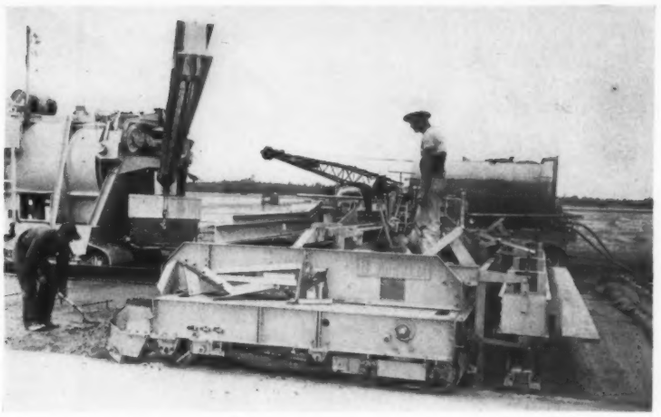
Leading the paving train was a new Ransome 34-E dual-drum paver. Operated from the subgrade outside the forms, the paver placed the mix on the grade ahead of the spreader and also pulled a trailer carrying a 1,000-gallon water tank. Other trucks replenished the supply in the trailer tank.

Distributed across the section by a



For more facts, use Reader-Reply Card opposite page 18 and circle No. 259

Quick moves with low-bed trailer speed paving of short strips for parking apron extension



A Blaw-Knox spreader with a B-K pan vibrator consolidates the concrete. The vibrator is driven by the spreader engine. At left, the Ransome 34-E dual-drum paver rides outside the 25-foot paving strip.

Blaw-Knox spreader, the concrete was vibrated by a Blaw-Knox tamping bar attached to the rear of the spreader and powered from the spreader engine. A Jaeger finishing machine and a Koehring longitudinal float finished the slabs. Most of the strips were laid 25 feet wide and provided with longitudinal center joints. Half-inch bars 30 inches long were set at 30-inch intervals ahead of the paver for this center joint. Each of these tie bars was attached to a pair of stakes driven into the base to assure positive and accurate placement of the bars. Hand finishing and a burlap drag completed the surface of the slab before a Flex-Plane curing spray applied a coat of Truscon white-pigmented curing compound.

Both transverse and longitudinal joints were sawed by a Clipper ConSawMatic self-propelled concrete saw. The joint specified was the double-cut type consisting of a ⅛-inch-wide cut to a depth of 1/6 of the pavement thickness. The top inch of the cut was widened to ¼ inch by a Clipper 14-inch abrasive blade.

However, when weather conditions dictated expeditious sawing to prevent uncontrolled cracking, a first cut was made ⅛ inch wide to full specified depth, and the top inch was widened at some convenient time later by resawing with an abrasive blade. Diamond-edged Clipper blades were used to make the cut first.

Water for the sawing operations was supplied by a 1,000-gallon tank mounted on a Dodge truck. A Flomax pump mounted on the chassis behind the tank supplied the water under pressure to the saw and transferred water from the truck tank to the trailer mixer tank when this truck was used as a nurse for the paver.

The special job-built trailer moved all of the equipment which traveled on the forms from one strip to the next as the work progressed. Because of the sandy nature of the subsoil in the work area, a Caterpillar D8 tractor was used to pull the trailer.

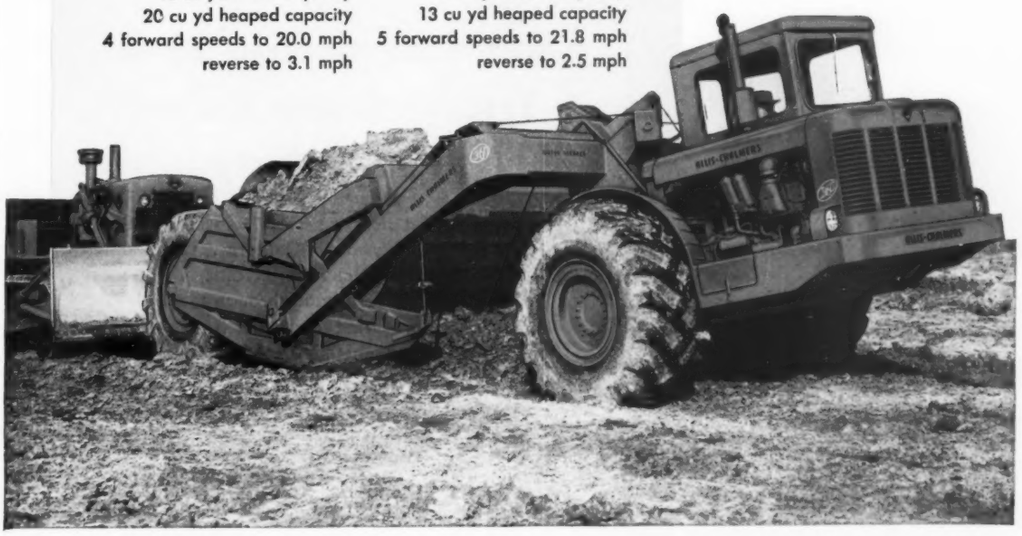
Quantities

Concrete batches were proportioned in a Butler batch plant set up adjacent to a railroad siding on the base near the work site. Two sizes of crushed-stone coarse aggregate, with maximum sizes of ¾-inch and 2 inches, were weighed from a Butler 50-ton two-compartment bin. Sand was handled from a separate Butler bin. All three aggregates were received by rail and were stockpiled and charged into bins by a Northwest crane with a clamshell bucket.

(Concluded on next page)

TS-360
280 hp diesel engine
15 cu yd struck capacity
20 cu yd heaped capacity
4 forward speeds to 20.0 mph
reverse to 3.1 mph

TS-200
176 hp diesel engine
10 cu yd struck capacity
13 cu yd heaped capacity
5 forward speeds to 21.8 mph
reverse to 2.5 mph



Shown above is an Allis-Chalmers Model 360 motor scraper and an HD-21 tractor.

get all these earth-moving advantages with Allis-Chalmers Motor Scrapers

Allis-Chalmers TS-360 and TS-200 motor scrapers are designed to meet the construction industry's ever-increasing demands for machines that will produce more, do today's jobs better and faster than ever before. Here are just a few of the advantages they offer for big-volume, low-cost earth moving.

More Usable Horsepower. New Allis-Chalmers diesel engines with Tornado Turbulence and follow-through combustion deliver greater torque, smoother operation, more complete burning of fuel and longer life.

Extra Traction. These motor scrapers provide greater tractive effort when loading or traveling. Two-thirds of the *empty weight* is carried on the drive wheels. *Loaded weight* is distributed equally between tractor and scraper wheels for better balance, safer hauling.

Positive Steering. Two-speed selective power steering provides safe, feather-touch response when traveling at high speeds, full maneuverability in cut or fill. Operator does not need to brake the wheels to steer; fast hydraulic action does the work for him.

Easy-Loading Bowl. Wide, low bowl design with curved bottom and offset cutting edge assures full-capacity loads in less time. Big apron opening — 102 inches on TS-360; 95 inches on TS-200 — speeds dumping of materials.

Visibility. Two-wheel tractor design increases operator vision, brings both ends of cutting edge into view. Result, more efficient loading and spreading, safer hauling.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 26C

At the batch plant at Wurtsmith Air Force Base, the two sizes of coarse aggregate are handled by the Butler 50-ton bin at left, while the bin at right handles sand. *C&E Staff Photo*

(Continued from preceding page)

Cement was handled from hopper-bottom cars to the batch trucks by a Butler cement plant with 650-barrel storage silo. The materials were weighed in 37.4-cubic-foot batches, which were hauled to the paver by eight rented batch trucks hauling two batches to the load. Darex air-entraining agent was added to each batch with the mixing water at a rate sufficient to produce an average air content of about 5½ per cent.

Personnel

Supervising the project for the Lewis & Frisinger Co. was superintendent Vic Burdick. Project engineer for the U. S. Army Corps of Engineers on the base was Francis Crevier, and Col. Arthur C. Nauman is district engineer of the Detroit District of the Corps of Engineers. Col. Ralph G. Taylor is the commanding officer at Wurtsmith Air Force Base.

THE END

TIGHT SQUEEZE

But Bucyrus-Erie 22-B Transit Crane Makes It Look Easy

This job, located along a narrow, tree-lined residential street in Pasadena, California, required the use of a compact clamshell-crane. A storm sewer trench had to be dug through tough decomposed granite and clay. Then, concrete pipe varying in diameter from 45 to 75 inches had to be installed.

The contractor on the job made the best possible choice: he put a Bucyrus-Erie 22-B Transit Crane to work. Assignments like this are tailor-made for this machine. It's easy to move around with its rubber-tired carrier — can work in tight, narrow quarters. You can use it, as this contractor did, for both excavating and crane work—clamshell, orange peel, and dragline are all operated on the regular crane boom. Above all, it's dependable—a machine you can count on for steady high production every time it starts a job.

Bucyrus-Erie Transit Cranes are available in two sizes — the 15-ton Model 15-B, the 25-ton Model 22-B. Your nearby Bucyrus-Erie distributor can give you complete information.

97E55C

Power controlled load lowering is one of the features the operator likes best about this 22-B. It helps him set pipe into position quickly and accurately. The job is part of a 10-year flood control project in Los Angeles county.

Boom folding mechanism (optional equipment at extra cost) permits crane booms 60 feet and longer to be folded with jib suspended underneath for moves between jobs.

BUCYRUS ERIE

South Milwaukee, Wisconsin

New vibratory screed has telescoping beam

■ A heavy-duty screed featuring an adjustable telescoping beam is available from the Creative Metals Corp., Emeryville, Calif. The screed comes in two sizes: one set of beams for shoe-plate contact of from 15½ to 23 feet, and another set for contact of from 22½ to 36 feet, both in fractional inch increments.

The new screed is currently being used in the construction of the increased overpass system of the San Francisco-Oakland Bay Bridge, and on other projects in California.

Shock mountings at the end-trucks and engine mounts protect engine and forms from the vibration. The telescoping feature reportedly does away with beam overhang and the need for separate screeds of varying lengths. The screed can easily be operated close to walls. A 3.6-hp engine developing 10,200 vibrations per minute operates both models.

Two models of a lightweight screed are also available for tilt-up slab work, industrial floor construction, and other jobs. One model covers any width between 10 and 15 feet, and the other widths between 15 and 25 feet. The same 3.6 hp engine provides power.

For further information, write to the Creative Metals Corp., 1290 Powell St., Emeryville, Calif., or use the Request Card at page 18. Circle No. 115.

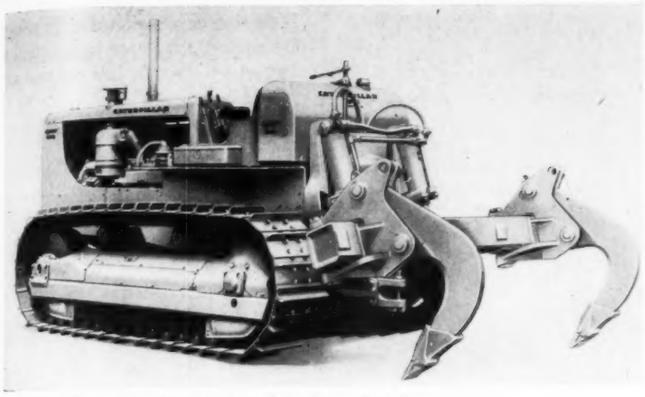
Steel water pipe

■ A brochure from the Steel Plate Fabricators Association covers all phases of the steel industry from the early history of pipe making to actual field installation of modern steel pipe. The manufacture of various types of steel pipe is covered with emphasis on testing procedures used on modern pipe.

Other chapters discuss the advantages of steel pipe, ductility and adaptability, installation in difficult terrain, field joints, and protective linings and coatings. Also included are a list of basic American Water Works Association specifications, and a bibliography of articles about water lines.

To obtain this brochure write to Steel Plate Fabricators Association, 79 W. Monroe St., Chicago, Ill., or use the Request Card at page 18. Circle No. 25.

←For more facts, circle No. 261



The new Caterpillar No. 8 heavy-duty ripper is a hydraulically operated attachment for the D8.

New heavy-duty ripper is tractor-mounted

■ Caterpillar Tractor Co. has announced a new hydraulically-operated ripper for use with the D8. According to the manufacturer, this heavy-duty tractor-mounted ripper is designed to provide better maneuverability and ease of operation than the tractor-towed type. Down pressure equivalent to the weight of the rear end of the tractor is available at the operator's fingertips.

The new No. 8 ripper is operated by means of a hydraulic control and two double-acting hydraulic cylinders. The hydraulic pump is mounted on and driven by the engine rear power takeoff, so that the ripper can be raised or lowered whenever the engine is running, independent of the flywheel clutch. The control valve is enclosed in the tank and provides the operator with raise, lower, hold, and float positions. The tank is mounted separately on the rear end of the tractor.

The ripper is mounted on special brackets which replace the standard drawbar brackets. The standard drawbar clevis is retained and may be used by swinging and pinning the ripper teeth up out of the way.

The ripper's two shanks are mounted on an alloy-steel box-section beam, and each is pinned to a clevis which provides a pivot mounting and allows the tooth to swivel 10 degrees to either side. The shanks are made of a special high-alloy steel and are heat-treated to resist abrasion and high shock loads. The teeth points are replaceable.

For further information write to Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 4.

Masonry scaffolding

■ Adjustable masonry scaffolding reaching to 23 feet with only one set-up is described in a catalog from Morgen Mfg. Co. The welded steel scaffolding with laborer platform extension is assembled by a two-man crew. A special material platform, and independent carriages for exterior and interior use are pictured.

To obtain this catalog write to Morgen Mfg. Co., 1115 N. Broadway, Yankton, S. Dak., or use the Request Card at page 18. Circle No. 35.

Concrete mortar additive provides speedy set

■ An additive for concrete mortars which is said to be exceptionally valuable on jobs where the use of dryers is prohibited is announced by the Flexrock Co. Concretdense is reported to make concrete watertight, non-dusting, and abrasion-resistant.

According to the manufacturer, the additive is especially useful on jobs where a quick finish is necessary. When it is added to new concrete, maximum bonding to the old concrete is assured, the company reports.

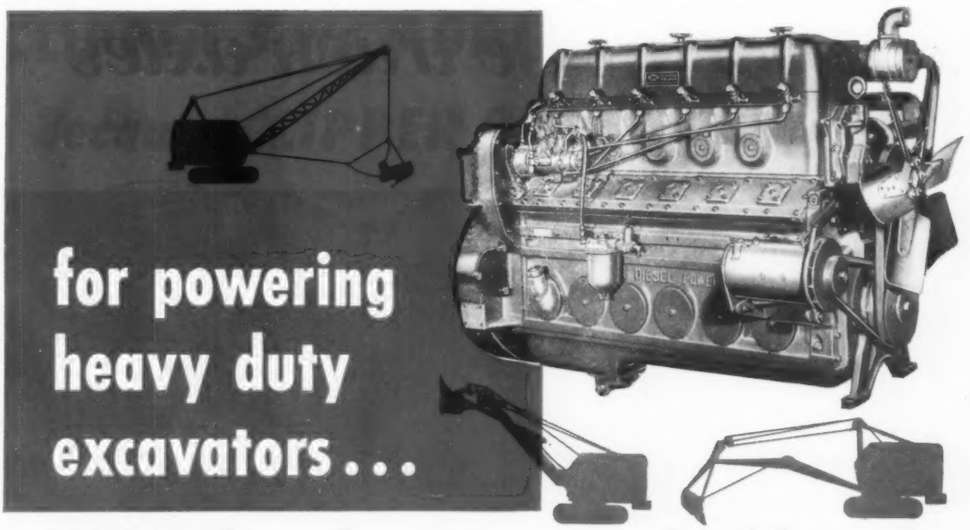
The material will not change the color of the concrete. It is reported not to cause corrosion of reinforcing wires and rods. It may be introduced into the mortar either at the mixing plant or at the job location.

For further information write to the Flexrock Co., 3624 Cuthbert St., Philadelphia 1, Pa., or use the Request Card at page 18. Circle No. 92.

Line of drilling equipment

■ A catalog from Brunner & Lay gives a complete listing of drilling equipment manufactured by the firm. Various models of cutters, hand and pneumatic chisels, moil points, tampers, and drill steels are only a few of the topics covered. A picture of each unit accompanies a list of models.

To obtain Catalog No. 852 write to Brunner & Lay Rock Bit Corp., 2514 E. Cumberland St., Philadelphia 25, Pa., or use the Request Card at page 18. Circle No. 44.



P&H diesels give you double value

1. Money Making Power...

For steady production at a high profit you can't beat the P&H Diesel 687-C18 for powering heavy duty excavators. It has the power, response and stamina to give you smooth, fast work cycles with every excavator attachment. You do more work, faster, at a lower cost.

A rugged, fast accelerating engine with a high torque, this 6-Cylinder P&H Diesel furnishes power to successfully handle the variable loads and momentary overloads encountered especially in shovel, dragline and trench-hoe services.

Costly down-time for restarts is held to a bare minimum. When heavy digging is encountered, the 2-Cycle P&H Diesel 687-C18 has the reserve power and punch to "pull through" without stuttering or stalling.

2. Money Saving Power...

Also, with a P&H Diesel you burn fewer gallons of low-cost fuel, you operate with less down-time for servicing and repairs, you experience longer periods between overhauls.

These money saving features of P&H Diesel power result from the extra reserve of power which is built into the P&H Engine 687-C18 for heavy duty excavator service. Reserve power minimizes engine stress and strain created by momentary overloads—adds to engine life—lowers maintenance costs—contributes to fuel economy.

P&H Diesel money making and money saving power add up to more power at lower operating cost for greater production and more profit for you.

P&H Diesel Engine Division
Harnischfeger Corporation
Crystal Lake, Illinois

Please send me complete information on P&H Diesel Engine 687-C18 for powering heavy duty excavators.

Name_____

Company_____

Street_____

City_____ Zone____ State_____

It will pay you to investigate P&H Diesel's unique double values for the powering of your heavy duty excavators from 1½ to 2 yards in size.

For Modern Engineering Look to

HARNISCHFEGER

P&H DIESEL ENGINE DIVISION
Crystal Lake, Illinois

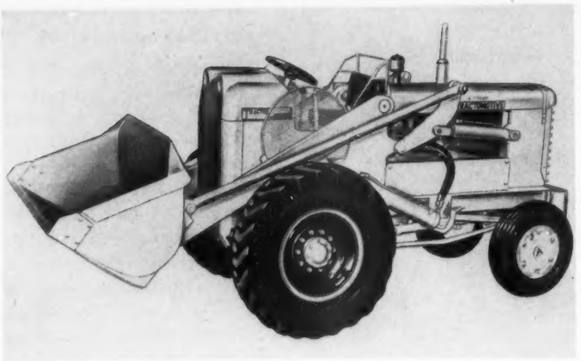
For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 262

Good maneuverability, capacity with new loader

■ Another addition to its line of front-end loaders is announced by Tractomotive Corp. The TL-11 Tracto-Loader, a 1⅛-cubic-yard unit, is designed for those operations requiring a machine with a large lifting capacity and capable of operating in confined areas.

The new Tracto-Loader has front-wheel drive for better traction, and is equipped with rear-wheel power steering. As with other Tracto-Loader models, it sports a 3:1 torque converter and a clutch-type transmission which permits changes in the direction of travel without shifting gears.

At the normal carrying height of 3 feet, the bucket can be tipped back to an angle of 41 degrees. This carrying angle is said to permit carrying heaped loads without spillage. At ground level, the bucket can be tipped back 22 degrees. Maximum clearance under the hinge pin when the bucket is dumped is 10 feet 3 inches, and at this dumping height the machine has a reach of 2 feet 7½ inches.



Over-all length of the TL-11 with the bucket in the carrying position is 15 feet 4 inches. In this position the machine can turn in a radius of 12 feet 3 inches, according to the manufacturer.

Power is furnished by either a 63-hp 4-cylinder gasoline engine or a 77-hp 6-cylinder diesel. A 12-volt electrical system is provided with the diesel model.

For further information write to Tractomotive Corp., Deerfield, Ill., or use the Request Card at page 18. Circle No. 80.

New, simple process bonds unlike metals

■ Low-cost bonding of unlike metal combinations, such as aluminum to copper or steel, is now possible with Percoloy, according to an announcement by the manufacturer, Precision Electronic Research Co.

Aluminum bonding to copper, for example, can be accomplished by applying a solder coat of 50-50 or 60-40 (60 per cent tin and 40 per cent lead) to the copper surface, employing a minimum amount of flux or acid. One of the three Percoloy bonding metals is then applied to the aluminum surface. The two parts are brought into contact through pressure, and heat is applied to effect the bond.

The three Percoloy bonding metals —Solbond, a low-temperature type; Brabond, a medium-low-temperature type, and Welbond, a high-strength high-melt-temperature type—are applied to the aluminum by stroking the bar back and forth across the bonding area. This is to assure that aluminum surface oxides are absorbed by the bonding metal.

This simple bonding process is said to permit economical bonding of many aluminum products which include other types of metals.

For further information write to Precision Electronic Research Co., Glendora, Calif., or use the Request Card at page 18. Circle No. 105.

Hose couplings

■ A revised catalog on the Quick-Seal line of connect-disconnect hose couplings has been released by Titeflex, Inc. The catalog contains cutaway views of the coupling, single and double-check valve modifications, tables for selection of seals for different coupling sizes, plus operating pressures, lists of accessories, etc.

To obtain this catalog write to Titeflex, Inc., 500 Frelinghuysen Ave., Newark, N. J., or use the Request Card at page 18. Circle No. 151.

Grapple tine control

■ The Ruhr Model M-1 grapple has each tine positively activated and independent of the others, according to a mailing piece from the manufacturer. A chart points out that the 10-ton unit is available in sizes from ⅓ to 3⅓-cubic-yard capacities.

To obtain this mailing piece write to Ruhr Industries, 1411 Walnut St., Philadelphia 2, Pa., or use the Request Card at page 18. Circle No. 75.

We broke these truck axles in the lab...

In the INTERNATIONAL Engineering Laboratory, axle shafts are tested by twisting them back and forth—hundreds of times—at stress points far beyond those of any normal truck operation. Axle shafts are approved for manufacture only when they withstand a prescribed high number of twists. Production line axle shafts must conform to the quality standards set up by this rigid test.

to save you the BIG money!

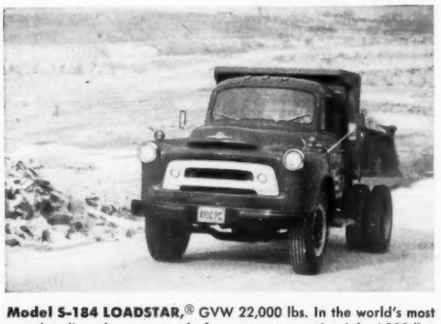
Pictured above is a group of once fine and costly INTERNATIONAL axle shafts that have been purposely twisted and broken. This is done to make sure your INTERNATIONAL rear axle will last longer and save you the BIG money—the over-the-years operation and maintenance money.

This rigorous axle-twist test is but one of many operations in the chain of INTERNATIONAL engineering that makes INTERNATIONALS *all-truck*. There are no passenger car compromises *anywhere* in INTERNATIONAL design, no passenger car engines or components asked to do a truck job.

And beyond this big plus of all-truck design, INTERNATIONAL gives you functional, practical, money-saving styling—extra comfortable driver-saving cabs—every modern driving feature.

If you use a truck to make money, see your INTERNATIONAL Dealer or Branch and start saving the BIG money!

INTERNATIONAL HARVESTER COMPANY • CHICAGO



Model S-184 LOADSTAR,® GVW 22,000 lbs. In the world's most complete line, there are trucks for every construction job, 4,200 lbs. to 90,000 lbs. GVW, with thousands of variations for exact job specialization.

INTERNATIONAL® TRUCKS

All-Truck Built to save you the BIG money!

Motor Trucks • Crawler Tractors • Industrial Power
McCormick® Farm Equipment and Farmall® Tractors

For more facts, use Reader-Reply Card opposite page 15 and circle No. 263

New lightweight concrete adapts to various uses

■ A chemical and a process which permits the manufacture of a lightweight concrete that is strong, self-insulating, highly moisture-resistant, and adaptable to many uses is being introduced in this country by Elastizell Corp. of America, Detroit, Mich.

The chemical, a liquid foaming agent, is called Elastizell. It reportedly has had wide usage in the accelerated postwar building program in West Germany, where it was developed.

According to the company, this lightweight concrete can be made with universally available materials such as ordinary sand and cement; can be used as floor fill in multi-storied commercial and public buildings, thus making possible extensive savings in weight and handling; and is ideal as a lightweight roof fill because it is highly insulating.

The Elastizell process permits positive control of densities over a wide range—from 40 to 150 pounds per cubic foot—and strengths from 600 to 3,000 psi for floor fills and from 300 to 600 psi for roof fills. On the other hand, extremely low densities —as low as 30 pounds per cubic foot —can be employed for special uses where strength is not a critical factor, as in insulation.

Elastizell is compounded of a foaming agent and a water soluble plastic agent. When these agents are mechanically mixed with wet concrete, in a special mixer, the result is a homogeneous cellular or bubble structure, light in weight because of the introduction of a high volume of air. The homogeneous structure results in a uniform strength, thus reducing the possibility of cracking due to varying densities and/or strengths throughout the mass.

Among other characteristics of this new concrete, according to the company, are that it is incombustible, therefore providing exceptional security against fire hazard, and that since the cellular structure is created mechanically, the concrete is non-corroding to steel.

For further information write to Elastizell Corporation of America, 15555 W. McNichols Road, Detroit 35, Mich., or use the Request Card at page 18. Circle No. 9.

Pneumatic tools

■ An air hammer and tool combination which is effective for boring holes in concrete or masonry, and for welding or riveting, is described in a bulletin on the Dotmar Air Ace from the manufacturer. The literature states that the 7-inch hammer delivers up to 3,000 blows per minute at 40 pounds pressure, and 4,500 blows at 100 pounds presure. On-the-job photos and complete specifications are included, and various models of pneumatic tools are described.

To obtain Bulletin 154 write to Dotmar Industries, Inc., 502 Hanselman Bldg., Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 48.

◄ Added to wet concrete in this special mixer, Elastizell produces a homogeneous cellular or bubble structure, light in weight because of the mechanical introduction of a high volume of air.

Mobile two-way radio

■ Nine models in GE's Progress Line —a family of related transmitter, receiver, power-supply, and optional-equipment chassis which are factory assembled in building-block fashion—are detailed in literature from the company. The models may be front or trunk-mounted between vehicles with 6 or 12-volt dc systems. The chassis blocks are rack-mounted in a standard 14-inch case. Complete specifications—input voltage, current drain, output voltage, circuit, size, and weight—are included.

To obtain this literature write to General Electric Co., 3001 James St., Syracuse, N. Y., or use the Request Card at page 18. Circle No. 17.

CLIPPER *Sells* MORE...
Because CLIPPER *Sells* QUALITY!

Clipper® CONCRETE SAWING BLADES

CALL ME!—I'LL HAVE A CLIPPER FACTORY-TRAINED REPRESENTATIVE ON YOUR JOB TO HELP YOU!

Mr. Clipper®

BLADE *for* BLADE
CUT *for* CUT...
Your BEST BUY *is* CLIPPER!

Clipper offers the only complete range of DIAMOND BLADES . . . and GREEN-CON ABRASIVE BLADES for all concrete sawing jobs. Use DIAMOND BLADES for green or cured concrete with ANY aggregate! Use GREEN-CON ABRASIVES for cutting green concrete. Clipper's FACTORY-TRAINED REPRESENTATIVES are always on call to help you with your concrete sawing problems.

You Cannot Buy A Better Blade than Clipper!

Remember...
CLIPPER *Sells* MORE
Because...
CLIPPER *Sells* QUALITY!

Clipper® KANSAS CITY, MO.

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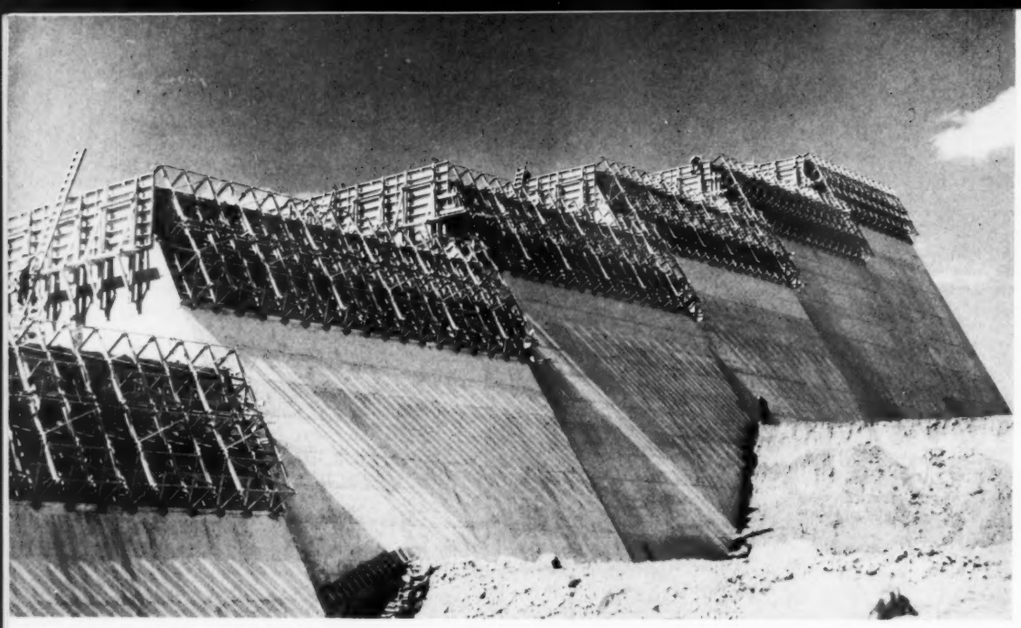


Forms of 7½-foot lifts, used on the upstream and downstream faces of the dam, are ready for use. The lower half is detached, raised over the upper section, and reset for succeeding lifts. Forms are hinged so that the upper half can be swung back out of the way as battered lifts are placed.
U. S. Army Corps of Engineers Photo

(*Additional photos on front cover*)

Hinged cantilever forms permit high lifts on Table Rock Dam

A big concrete plant, with an elaborate refrigeration system, produces cool concrete in hot weather for multipurpose project

by RALPH MONSON, field editor

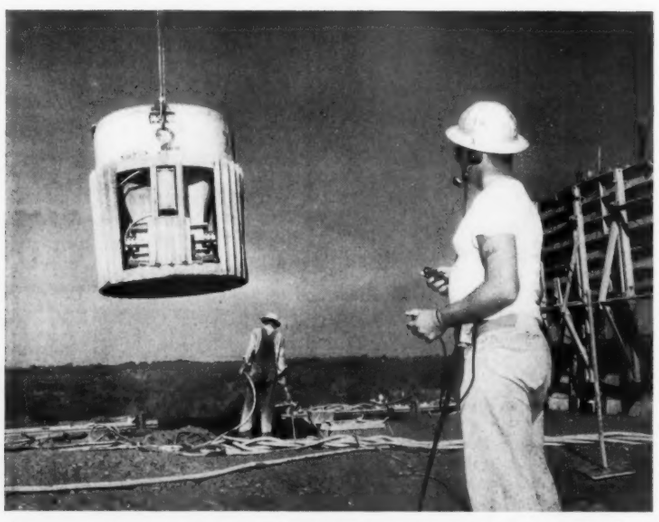
Using an ingenious system of box-truss cantilever forms, the contractor for Table Rock Dam, about 8 miles upstream from Branson, Mo., on the White River, is casting the concrete monoliths in 7½-foot lifts instead of the usual 5-foot lifts. Forms for the almost vertical upstream face of the dam are made up in 15-foot sections. On completion of a 7½-foot lift, the lower half of the form is disconnected and leap-frogged over the upper half and into position for the next lift.

Forms are similar for the flatter slope of the downstream face, but they are also hinged in the middle of the lift so that the top half can be tilted back out of the way to permit the bucket to get close to the toe as concrete is placed for the first half of the lift. When the lower half has been cast, the form is quickly tipped back into position and pinned in place for the completion of the lift. This is perhaps the first time a 7½-foot lift has been used on a U. S. Army Corps of Engineers' dam project, and it is the hinged form that makes such a lift acceptable under the specifications.

This form system, together with a huge concrete plant and two 2,600-foot cableways—one handling an 8-cubic-yard concrete bucket and the other a 4-cubic-yard bucket—has enabled the contractor to place 45,000 to 50,000 cubic yards of concrete each month since placement began in May, 1955. The largest amount placed in a 24-hour period came to 2,868 cubic yards. This work, continuing throughout the winter, will make it possible for a start to be made on impounding water this year.

The reservoir to be made by this multipurpose structure—the third of a series for controlling floodwaters of the White River and producing electric power—will extend 80 miles westward into Missouri and Arkansas, creating a lake that will have a 745-mile shore line and cover 43,100 acres at the top of power pool elevation.

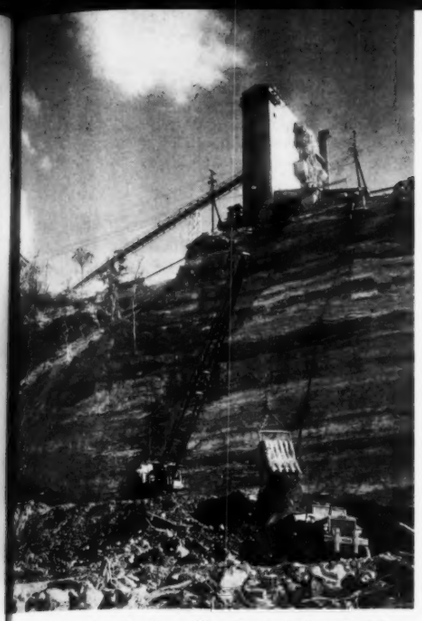
Big windows in the control tower for the cableway allow the operator to keep the bucket in sight. The tower travels on its own track so that it can be spotted for the best view of the operations.



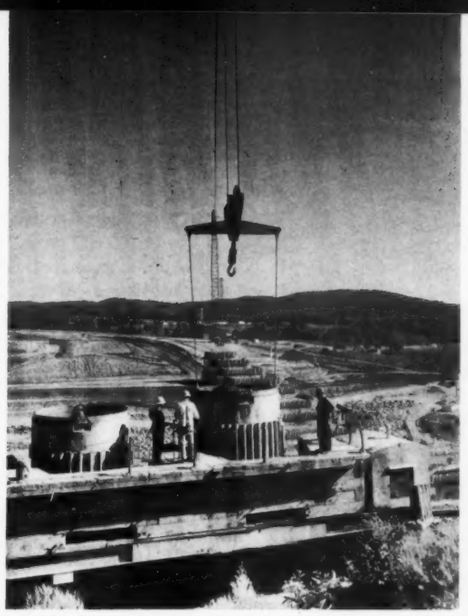
Bellman Jim Marinus uses bell and voice signals, transmitted by Motorola short-wave radio, to direct the control tower operator in spotting the Gar-Bro bucket.
C&E Staff Photo

Concrete section in channel

The $24.5 million contract for the 1,600-foot concrete gravity section and the embankment that tie the structure into the adjacent hills is being handled by a joint venture going under the name of Morrison-Knudsen Co., Inc., and Utah Construction Co. The six contractors in this venture include the sponsor, Morrison-Knudsen Co., Inc., Boise, Idaho; Utah Construction Co., San Francisco, Calif.; H. B. Zachry Co., San Antonio, Texas; Ralph E. Mills



Excavation in the stilling basin is handled by a Marion Model 111 dragline with Esco 5½-yard bucket. Atop the bluff are the refrigeration and concrete mixing plants. *C&E Staff Photo*



After placing an empty on the car, the cableway picks up a Gar-Bro 8-yard bucket and prepares to swing it out over the valley to a monolith. In the background is the 425-foot-high head tower of the cableway. *C&E Staff Photo*

The bucket spotted, an air hose is attached to it to open the air-operated gates. As the concrete spills out and the weight is reduced, the bucket rises and the air line is disconnected. *C&E Staff Photo*

Co., Inc., Salem, Va.; General Construction Co., Seattle, Wash.; and Fruin-Colnon Contracting Co., St. Louis, Mo. Planning and supervision of the project is being done by the Little Rock District of the U. S. Army Corps of Engineers. This contract, contracts preceding it, and subsequent contracts for such things as powerhouse, generators, switchyard, and reservoir improvements, will bring the estimated cost of the dam to $69 million.

Part of the MK-Utah contract, which is scheduled for completion in 1958, is for the concrete gravity section of the dam. This section, 1,600 feet long and 261 feet above the lowest foundations, has an upstream face battered at a rate of 1.5 to 10, while the downstream face has a batter of 6.3 horizontal to 10 vertical. The completed dam will contain 1.16 million cubic yards of mass concrete and more than 72,000 cubic yards of other grades of concrete.

The central section of the dam is a 531-foot-wide overflow spillway with ten 45-foot wide and 37-foot high tainter gates. Through the base of this section are four 4×9-foot sluiceways that will be controlled by hydraulically operated slide gates. These sluiceways will be used to divert the river during construction of the dam.

Extending 250 feet downstream from the spillway section is a stilling basin that will dissipate the energy of water coming over the crest or through the sluiceways. It runs the entire 531-foot width of the spillway, and consists of a concrete slab, with a minimum thickness of 5 feet, constructed with concrete baffles.

On the north side of the spillway is the left abutment of the dam, which contains the power intake facilities. Each of the four 18-foot-diameter penstocks in this section will have a 19×26-foot power operated gate. The powerhouse, to be built under a separate contract, will be just downstream from this section. It will have two 50,000-kw generators and room for two more in the future.

The right abutment to the south of the spillway section ties the concrete structure into the nearly vertical bluff forming the south bank of the river. A relatively low and short earth embankment joins this abutment to the nearby hill. A longer and higher embankment is required on the left bank.

Earth dikes

The impervious earth dikes, extending a total of 4,821 feet from the ends of the concrete section, carry the structure into the hills and complete closure of the valley. These have a 35-foot width at the top to form an access roadway. The maximum height of the embankment is 175 feet. The slope at the top of the upstream face, 2.5 to 1, goes to 3 to 1, then to a flat 4 to 1 at the lower edge. Most of the upstream face is lined with 18 inches of stone riprap placed on a 6-inch backing course. The slope of the downstream face varies from 2 to 1 at the top to 3 to 1 at the bottom.

The core of the dam is an impervi-

As the bucket reaches the north side of the river, the cableway operator depends on a signalman at the forms for help in placing the bucket accurately. Behind the monoliths is the winding earth embankment of the north dike. *C&E Staff Photo*

Cement stored in two 5,600-barrel silos is taken by elevator to bins at the top of the Johnson automatic concrete plant. Aggregates are delivered by the conveyor in the background. Mixing is done by three Koehring 4-yard units. Refrigeration equipment is housed in the section behind the stairway tower. *C&E Staff Photo*

(Continued from preceding page)

ous earth fill, protected from wave action by riprap on the upstream side. A layer of pervious filter material in the downstream section provides drainage. Altogether, a total of 3,320,000 cubic yards of material is contained in both dikes.

Concrete production

The large amount of concrete needed daily by MK-Utah crews is being produced in a big Johnson automatic plant that stands on the bluff beside the right abutment of the dam. The plant, equipped with three Koehring 4-yard mixers, has a rated capacity of 225 cubic yards per hour and has actually produced close to 3,300 cubic yards in a single day. Important in this setup is a refrigeration plant that cools water and aggregates and produces ice to hold the temperature of the concrete under 50 degrees during warm weather.

Four sizes of coarse aggregate ranging from 6-inch to ¾-inch and two sizes of sand are being produced from material obtained from the

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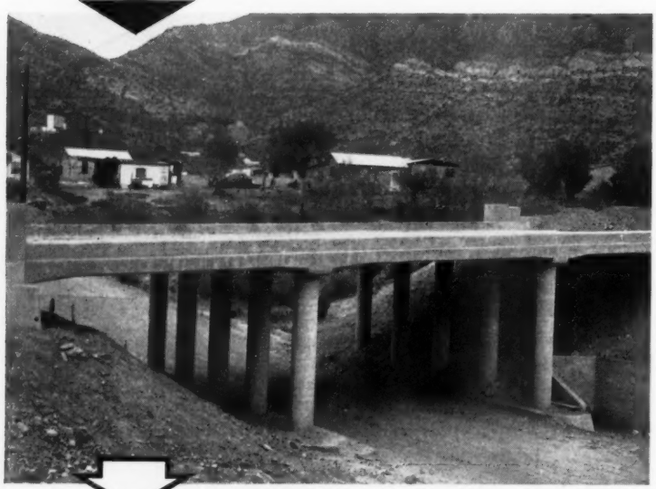

Highway Bridge, Superior, Arizona, Arizona State Hwy. Dept., Geo. E. Lang, State Highway Engineer, Bentson Construction Co., Phoenix, contractors, S. W. Henderson, job superintendent.

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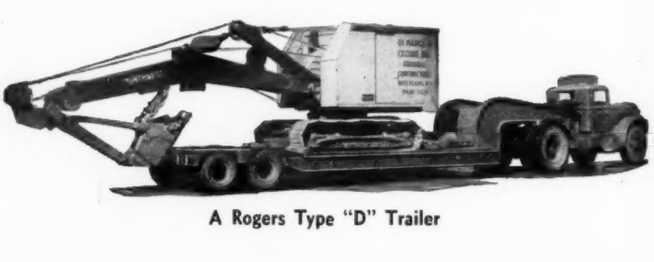
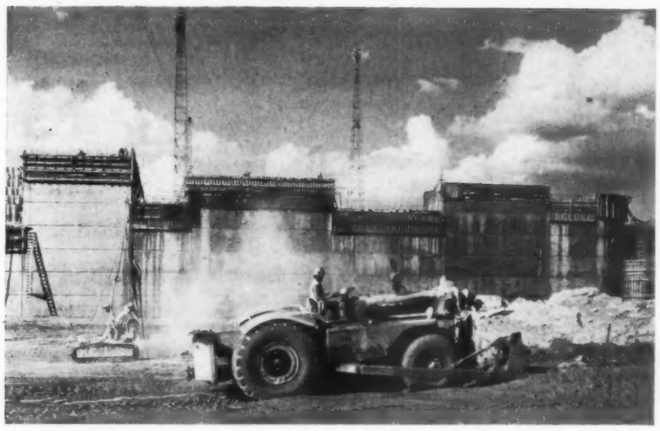


A Rogers Type "D" Trailer

For more facts, use Reader-Reply Card opposite page 18 and circle No. 266

A Caterpillar DW20 tractor with blade dozes mud away from drill crews in the background. Drilling is being done by an Ingersoll-Rand wagon drill mounted on an Air Trac. *C&E Staff Photo*



Baird Mountain quarry adjacent to the dam site. See "Mile-Long Conveyor System Delivers Rock for Concrete Dam," page 88.

Aggregates are recovered from stockpiles by a 30-inch conveyor-belt system running 840 feet under the stockpiles in a laminated oak tunnel 10 feet wide and 7 feet high. An inclined conveyor runs from the mouth of the tunnel to the swivel distributor chute at the top of the plant. A workman stationed here rotates the chute to the proper bins as material comes up the belt. Remote controls permit him to operate the Jeffrey pan feeders that deliver materials from stockpiles to the recovery conveyor.

Natural and portland cements are blended in the concrete mix, the ratio being 25 per cent natural cement and 75 per cent portland cement. The Universal Atlas portland cement for the job is brought by rail from the Mill at Independence, Kans., to a siding at Gretna, about eight miles from the dam. Here, a Johnson cement plant unloads the hopper cars and stores the cement in a 7,500-barrel silo.

The haul from the siding to the plant, handled by subcontractor H. E. Reynolds, Branson, is made with two Fruehauf trailers pulled by a butane-burning Kenworth truck. Each big trailer, carrying 115 barrels of cement, is made largely of aluminum so that dead weight is held to a minimum and payloads are at a maximum.

Only one such trailer is pulled by each of the trucks hauling natural cement from Fort Scott Hydraulic Cement Co., Inc., Fort Scott, Kans., to the job. Concrete dumped from trailers to hoppers at the concrete plant is carried by screw conveyors and elevators to two 5,600-barrel storage silos. Elevators carry the cement from the silos to bins at the top of the plant.

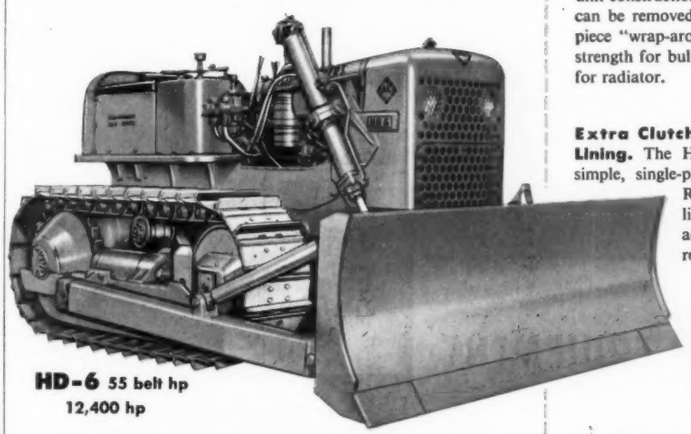
Water for the mix and other plant uses is pumped from the White River to a reservoir at the top of the bank. From the reservoir, which was formed by the construction of an earth dike across a canyon near the plant, water is pumped by six 8 and 12-inch Pamona vertical turbine pumps to all parts of the job. An elevated storage tank helps maintain a uniform head and reserve supply of water.

Materials for the concrete are weighted out in batches by the automatic scales of the plant and charged into the three Koehring 4-yard mixers on the lower platform. A typical 4-yard batch of the 2½-sack interior-mass concrete mix is composed of:

6-inch rock	4,110 pounds
3-inch rock	3,501 pounds
1½-inch rock	2,436 pounds
¾-inch rock	1,674 pounds
Coarse sand	1,066 pounds
Fine sand	2,436 pounds
Portland cement (Type II)	705 pounds
Natural cement	212.5 pounds
Water	697 pounds
Protex AEA	12 to 18 ounces

(*Continued on next page*)

This kind of Crawler Tractor Design gives you extra output



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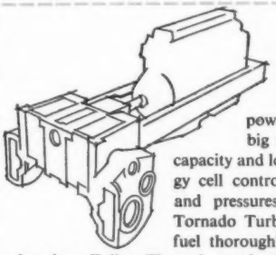

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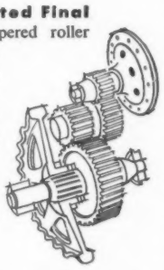

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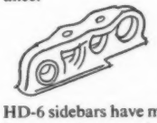

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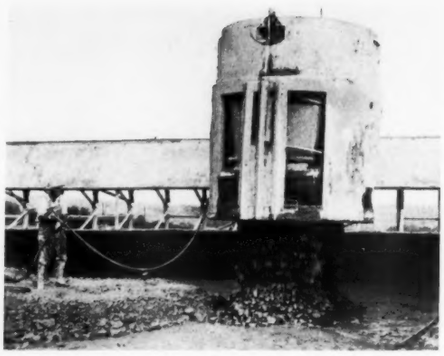
(*Continued from preceding page*)

The exterior mass concrete is a four-sack mix. Lighter sections are cast with a four-sack mix containing 3-inch-maximum aggregate. Ice was substituted for some of the water in warm weather, so that concrete was kept at or below the 50-degree temperature permitted by the specifications. A maximum of 450 pounds of flake ice was used on very hot days in concrete containing 3-inch-maximum size aggregate.



Concrete is placed near the downstream form, the upper hinged section of which is open as the lift starts. When concrete is level with the bottom half of the form, the top half will be swung back and placing continued without lost time.

U. S. Army Corps of Engineers Photo

Refrigeration plant

Since concrete was permitted to have a maximum temperature of only 50 degrees at the time it was placed, and ingredients had to be cooled during a large part of the year, an elaborate refrigeration plant was set up near the concrete plant.

Four methods, or any combination of them, depending on conditions during the day, were used to cool the concrete. These included: (1) precooling the coarse aggregates, (2) using refrigerated water in the mix, (3) using flake ice in the mix, and (4) circulating cold air in the aggregate-storage areas of the plant.

Coarse aggregates were precooled in four big Armco tanks at the site, two of them measuring 32 feet in diameter and 42 feet in height, the other two measuring 36 feet in diameter and 45 feet in height. Refrigerated air was circulated through the aggregates in these tanks at about 40 degrees F and returned to the refrigeration plant at about 70 degrees F. Refrigerated air was also circulated through aggregate-storage bins in the concrete plant to hold temperatures down.

The plant providing this cold air, as well as the ice and refrigerated water, consisted of eight York and one Frick ammonia compressors. The plant, with a total capacity of 800 tons of refrigeration, also included five York flake-ice machines that produced up to 100 tons of ice per day for use in the mixes. The compressors were driven by electric motors, ranging from 60 to 300 horsepower, that gave the plant a total load of 1,105 horsepower. Both the refrigeration plant and concrete plant were housed in metal-clad insulated buildings. Pipes and air ducts were also insulated.

Since concrete placement continued through the winter, even on days when the mix could freeze before hydration had a chance to raise the temperature of the concrete, a heating plant was required. The plant was equipped with a hot-water heater that provided warm water for the mixes and, in extreme cold, preheated the aggregates. Fires, insulated forms, and coverings were used to protect concrete once it had been placed.

Cableways deliver concrete

Some big equipment is making a smooth operation of the gigantic job of placing concrete. The 4-yard batches are discharged from the plant mixers to a 12-yard hopper, then to Gar-Bro 8-cubic-yard buckets that place the material. One Gar-Bro bucket is carried to the cableway by a self-propelled diesel-electric car having room for two buckets. At the cableway, an empty bucket is placed on the car and the full one is picked up, and swung across the valley to the monolith being poured.

The TravelLift cableway, spanning 2,600 feet across the valley, consists of a 3¼-inch lock-coil cable suspended between a head tower on the north bank and a traveling tail tower on the south bank. At the base of the 425-foot head tower is the 500-hp electric motor operating the cableway. The 167-foot rail-mounted and self-propelled tail tower, set atop the high south bank, has a transverse travel range of 1,000 feet.

The traveler on the cable handles loads weighing up to 77,000 pounds, including the weight of the carriage, bucket, and concrete. It picks the 21-ton live load off the cars and swings it across the valley at a speed of 1,500 feet per minute, while the operator raises or lowers the load traveling to the point of placement.

Operator uses TV

The controls for this cableway are

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in a control tower traveling on rails entirely independent of those of the tail tower. This allows the operator to be stationed where he has the most advantageous view of all the operations. The newest piece of equipment for his use is an RCA closed-circuit television system that permits him to see the driving equipment at the foot of the head tower, half a mile away. A television camera is focused on this equipment, and the picture is transmitted by wire to a screen in the control tower. At a glance, the operator can see just which drums are turning and judge his controls accordingly. This up-to-the-minute picture of just what is happening allows him to make immediate responses.

Slightly downstream and paralleling this cableway is a small Lidgerwood cableway that handles 4-cubic-yard concrete buckets and materials used in the construction of the stilling basin, training walls, and other facilities. Its 2¾-inch lock-coil cable spans 2,350 feet across the valley. A 200-foot tail tower and a 125-foot traveling head tower support this cableway, which handles the Blaw-Knox side-delivery concrete buckets being shuttled to and from the plant on the same type of cars hauling the larger buckets to the larger cableway. This smaller system is used only as required, while the larger one works round-the-clock from 5 to 7 days a week.

Radio directs bucket

Since the distance from the control tower to the points of placement makes it impossible for the operator in the tower to spot the bucket accurately for the placing crew, a signal man stays with the placing crew and directs the operator by voice and bell signals transmitted by a Motorola short-wave radio system.

The microphone and earphones in his headset and the bell signals he holds are connected to the short-wave portable radio he carries from place to place. As the concrete bucket nears a pour, the signal man takes over from the operator, directing every operation of the cableway until the bucket is maneuvered into the placing position. Then a workman attaches the air line that operates the gates of the double-compartment bucket and turns on the air to open the gates and dump the concrete into the forms. As the load lessens, the bucket rises rapidly, disconnecting the air line. The empty is then returned to the car to be exchanged for another full bucket.

As the concrete is placed in the forms, workmen using Malan 6-inch air-operated vibrators work the mix into place. The lean mix and large aggregate produce concrete that will support the workmen, but the big vibrators operating at 6,000 cycles per minute make even this harsh mix seem plastic as it is worked into place.

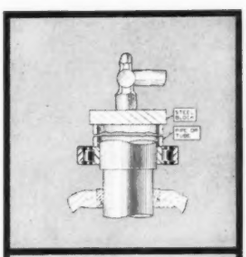
Hinged forms

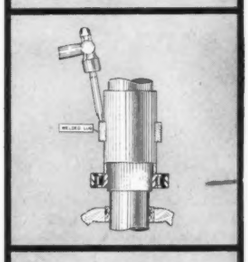
Though the contractor had a choice of pouring the monoliths in 5 or 7½-foot lifts, he had to get the concrete properly placed against the sloping downstream form. This requirement was satisfied by the use of the hinged box-truss form.

Designed and built by Records & Stephens Co., San Antonio, Texas, and based on an idea developed by B. Williams, vice-president in charge of dam construction for Morrison-Knudsen Co., the forms have a backing that consists of a series of box trusses made of steel channels and angles. The forms for the upstream face are assembled in 7½-foot lifts, two of which are bolted together to form the cantilever form. When a lift has been placed, the form for that lift remains in place and becomes the anchor for the next lift. The 7½-foot section from the preced-

(Continued on next page)

Portland cement is delivered to the batch plant in two Fruehauf 115-barrel aluminum trailers pulled by a butane-burning Kenworth truck. Single trailers haul natural cement to the plant. *C&E Staff Photo*





How to press a Hyatt Bearing off or on

by HY WHEELER, the sage of the socket wrench

Most bearing damage results from improper operating conditions, or from *improper handling during installation and removal.* A little extra care in pressing bearings on or off may save a lot of time and money in the long run!

The best thing to use is an *arbor press* or a *bearing puller.* If neither is available, or can't be used, you can drive the bearing with a hammer—but *be careful to avoid injury to yourself or damage to the bearing.* REMEMBER:

1. Always direct the force *against the face of the press-fitted race* (usually the rotating one) to avoid damage to separators, rollers, etc.

2. Never hammer directly on races or separators and never use a wood or soft metal mallet; chips or splinters may get into the bearing.

3. In driving, use many smart, quick taps alternately on opposite sides to prevent the race from cocking and harming the shaft.

4. *Make sure your hands, tools and surroundings are clean—dirt quickly ruins bearings.*

AND ALWAYS REPLACE A HYATT WITH ANOTHER HYATT TO ASSURE PERFECT FIT AND PERFORMANCE. REMEMBER, WHEN IT COMES TO QUALITY...

there's no substitute for...

AVAILABLE THROUGH UNITED MOTORS DISTRIBUTORS

GM PARTS SALES

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 269

Sand-clay embankment material for the earth dikes at the end of the concrete sections is loaded into a Euclid 17-yard bottom-dump unit at the borrow pit in the reservoir area. The Sierra loader is pulled by an International TD-24. *C&E Staff Photo*

(Continued from preceding page)

ing lift is then detached, raised to a new position, and bolted to the top of the anchor section. In this way the sections leap-frog each other as the monolith rises.

Since these 7½-foot sections would overhang on the downstream face of the dam where the slope is 6.3 horizontal to 10 vertical, the forms were hinged in the middle of the lift. If this had not been done, the big concrete buckets would not have been able to deposit the concrete close enough to the form at the bottom of the lift, in the opinion of the Corps of Engineers. The hinge point is at the back chord of the truss, so that the form swings up and out when it is tipped back. When concrete has been placed for the first half of a lift, the forms are simply tipped back and the front chord members bolted together.

Bulkhead forms are Blaw-Knox cantilever steel forms trussed for the 7½-foot lifts. These forms are of conventional construction and are hoisted from one lift to the next in the normal manner. Williams form hardware is used with both types of forms.

Concrete placement started with monoliths 1 through 10, and monolith 15 of the left abutment. When these were substantially started, the river was diverted through blocks 11 to 14 while the excavation was carried on in the old channel for the spillway portion of the dam and the stilling basin. This earth and rock excavation was handled by a spread of equipment that included a Marion 111 dragline with a 5½-yard Esco bucket, a Bucyrus-Erie 54-B shovel, and a Northwest 6 dragline. A fleet of end-dump and bottom-dump Euclids hauled the materials to the earth embankments or to waste areas.

Rock excavation was done with the aid of wagon drills mounted on Air Tracs and powered by an Ingersoll-Rand Gyro-Flo 600 compressor mounted on the frame of a Euclid truck. An International TD-24 tractor-dozer, several Caterpillar D8 tractor-dozers, and other supporting equipment assisted on this excavation.

When excavation was complete, the stilling basin slab was placed and all of the spillway monoliths started.

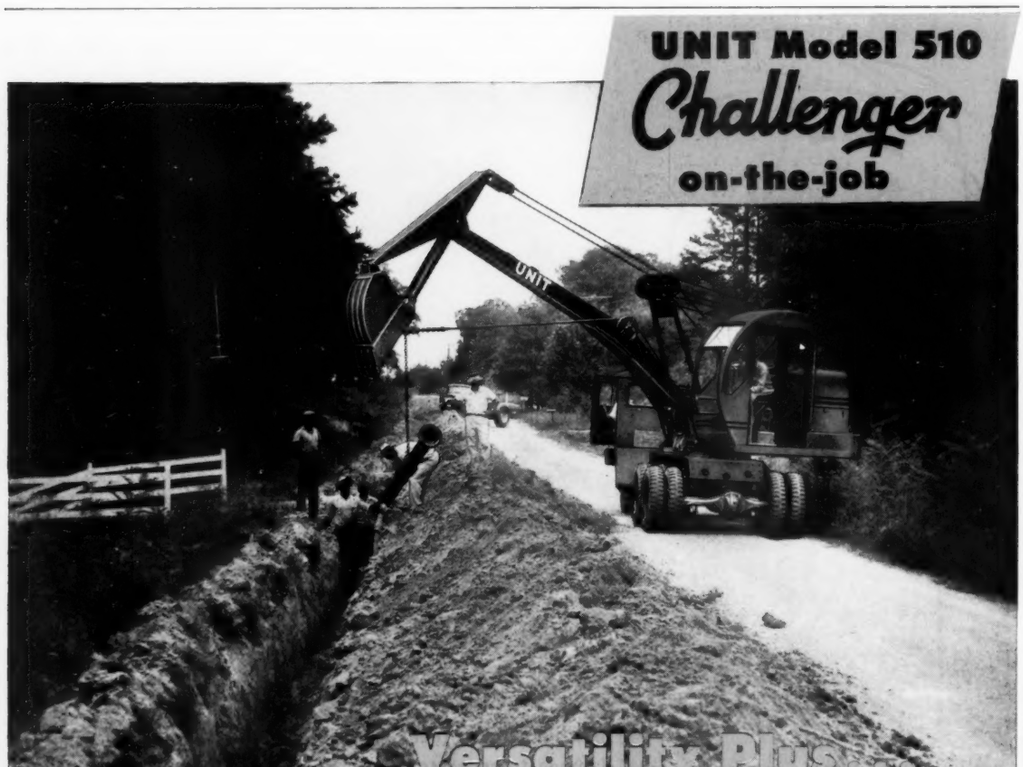
The next step will be to divert the river through the low monoliths of the spillway while monoliths 11 through 14 are constructed. These sections will contain the four power penstocks. In the succeeding stage, the river will be carried through the sluiceways in blocks 16 through 19 as the remainder of the dam is built.

During the second stage of this work, monoliths 10 and 15 were subjected to sharp changes in temperature. Their faces were exposed during the winter preceding the construction of monoliths 11 through 14. At this time, the faces were protected with a layer of 1-inch-thick Styrofoam insulation. The 1×9-foot sheets were laid against the concrete and held in place by sheets of ¼-inch plywood, which were attached to the concrete by ¼-inch studs set with a Ramset 22-caliber powder-actuated tool. This 1¼ inches of insulation and plywood was accepted as a substitute for 3½ inches of lumber.

Build earth embankments

The earth embankment connecting the left abutment and the hills was started in the spring of 1955, the work being carried on simultaneously with concrete construction. Clay-sand soil for the impervious core of the dike was obtained from borrow pits in the reservoir area. A Sierra loader pulled by an International TD-24 tractor loaded the material to a fleet of 10 new 17-yard bottom-dump Euclids, powered by GMC 300-hp diesel engines, that made the haul to the embankment.

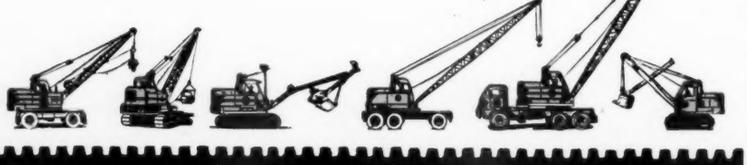
On the fills, the material was



UNIT 3/8 yd. Trenchoe "Pinch Hits" for Crane on a Pipe Lifting Job

On pipe line construction jobs, the UNIT Challenger provides "Double Duty Performance" . . . It trenches . . . picks up pipe strung along the side . . . positions pipe for permanent installation . . . then backfills. UNIT Challenger is ideal because it has a full 360° swing . . . and the FULL VISION CAB gives unmatched visibility *on all sides*. It will pay you to investigate such UNIT features as **One-piece-cast main machinery case . . . Modern transmission design . . . Alloy steels and forgings . . . Involute splines . . . Force feed lubrication . . . Straight-in-line engine mounting . . . Hydraulic actuated clutches . . . Full floating, trunnion mounted taper drums . . . Torque Converter . . . Safety promoting Full Vision Cab** — and many other advanced features. Write for copy of Bulletin C-800.

UNIT CRANE & SHOVEL CORP.
6309 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.



SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 270

shaped and manipulated by Caterpillar D8 tractor-dozers, some of which were fitted with rear-mounted scarifiers. Water was hauled by two Euclid water wagons, one of 3,000 and one of 5,000-gallon-capacity. Two Southwest 50-ton compactors pulled by Caterpillar D8 and International TD-24 tractors applied the compaction, and an Adams 660 motor grader did finishing work and maintained the haul roads.

Material for the filter blanket on the downstream side of the embankment was produced from river deposits by a subcontractor, C. W. Allen of Wilburton, Okla. Rock for the upstream face of the dike was obtained from a special quarry.

Personnel

Supervising the construction for the Morrison-Knudsen and Utah Construction combine was a staff headed by project manager Arthur Campbell. Other supervisors include project engineer C. W. Bolton, general superintendent Harold Maxwell, office manager Dennis Lucy, plant superintendent Jim Poynter, concrete superintendent Don Atkins, and earthwork superintendent John Logan. Construction is under the direction of B. Williams, vice president of Morrison-Knudsen Co., Inc.

Representing the Little Rock District of the U. S. Army Corps of Engineers on the project are L. F. Sherman, project engineer; J. W. Storey, assistant project engineer; Sam McClure, concrete technician; and P. M. Brown, head field engineer. The district engineer of the Little Rock District is Col. Staunton L. Brown.

THE END

Plotting instruments

■ Two Italian-made plotting instruments—the Stereocartograph Galileo-Santoni Model IV and the Stereosimplex Model II—are described in leaflets from the Opplem Co. The Model IV makes it possible to pass with continuity from vertical to ground exposures without inverting the y and x axes. While the optical system remains fixed, each plate holder is capable of displacement along its plane while preserving the initial orientation, according to the leaflet.

The Model II can be used for ground plotting and aerial triangulation. A special glass plate reduces distortion and vigneting to a minimum, the leaflet claims.

To obtain these leaflets write to Opplem Co., 83 Uhland St., East Rutherford, N. J., or use the Request Card at page 18. Circle No. 77.

Hydraulic truck loader

■ The Lodal, a multipurpose hydraulic truck loader, is featured in a bulletin from Lodal, Inc. Action shots of the 3,000-pound-capacity unit show it loading one truck and a fleet of trucks. Specifications and advantages of the Lodal are detailed.

To obtain this bulletin write to Lodal, Inc., Walnut and Railroad Sts., Norway, Mich., or use the Request Card at page 18. Circle No. 67.

"Wassamatter with you guys—get a move on out there — we're way behind time . . ."

Barrows, heaters

■ Concrete barrows, a mortar pan, and a mortar mixing box are briefly described in a mailing piece from the manufacturer, Jackson Mfg. Co. The barrows have capacities from 4 to 6½ cubic feet. Also detailed are the Hi-Heat Model 500 and Model 750 salamanders. Operating on liquid petroleum gas, these models have capacities of 50,000 and 75,000 Btu per hour, respectively.

To obtain this mailing piece write to Jackson Mfg. Co., P. O. Box 9, Harrisburg, Pa., or use the Request Card at page 18. Circle No. 45.

Aerial view of Sewage Treatment Plant, Valparaiso, Indiana. Duraplastic cement provides protection against freezing-thawing weather.

Construction view of tank shows Duraplastic-made concrete in place. Duraplastic gives excellent placeability and durability.

"Our contractors are completely satisfied with Duraplastic*"

. . . said Ready-Mix supplier Byron Smith, President of Smith Nuppnau Ready-Mix, Inc., Valparaiso, Indiana. "Duraplastic's ability to fortify concrete against freezing-thawing weather is outstanding, and the lack of segregation and reduced finishing time please contractors."

You, too, will get more durable, more uniform concrete with Atlas Duraplastic air-entraining portland cement, because you get a more plastic, more cohesive mix. Less mixing water is required for a given slump . . . segregation and water gain are minimized.

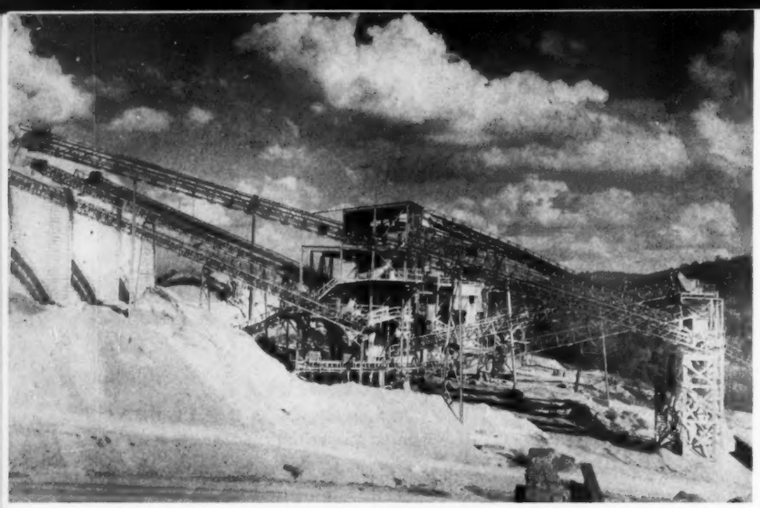
YET DURAPLASTIC COSTS NO MORE than regular cement—requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write:

UNIVERSAL ATLAS CEMENT COMPANY
UNITED STATES STEEL (USS) CORPORATION SUBSIDIARY
100 PARK AVENUE, NEW YORK 17, N. Y.
OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*

*"DURAPLASTIC" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

AIR-ENTRAINING PORTLAND
CP-D-181-C
Atlas® Duraplastic Cement
MAKES BETTER CONCRETE AT NO EXTRA COST

United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.



At the plant, coarse aggregates are delivered to the Armco bins, left, for cooling. Sand is processed by rod mills and a Conveyco sand classifier before being delivered to stockpiles beyond the plant. *C&E Staff Photo*

Mile-long conveyor system delivers rock for concrete dam

Coarse aggregate and sand, produced by crushing plant, goes into 1-1/4 million yards of concrete for Table Rock Dam

Crushed rock aggregates for the 1¼ million cubic yards of concrete going into Table Rock Dam on the White River are traveling more than a mile from the hilltop quarry where they are produced to the crushing and screening plant at the dam site.

Another half mile of conveyors carries this material through the plant, delivering the six sizes of finished aggregates to their respective stockpiles. A third system of conveyors recovers the aggregates from the stockpiles and deliver them to the bins of the concrete plant.

This extensive rock-production and processing operation is being carried on under the $24.5 million contract awarded for the construction of the dam to a combine going under the name of Morrison-Knudsen Co., Inc., and Utah Construction Co.

The Baird Mountain quarry, located about a mile southeast of the right abutment of the dam, and near the summit of the mountain, had been drilled and tested before the contract was awarded. But since it had not been opened, shovels and dozers had to strip some 200,000 cubic yards of overburden to expose the rock.

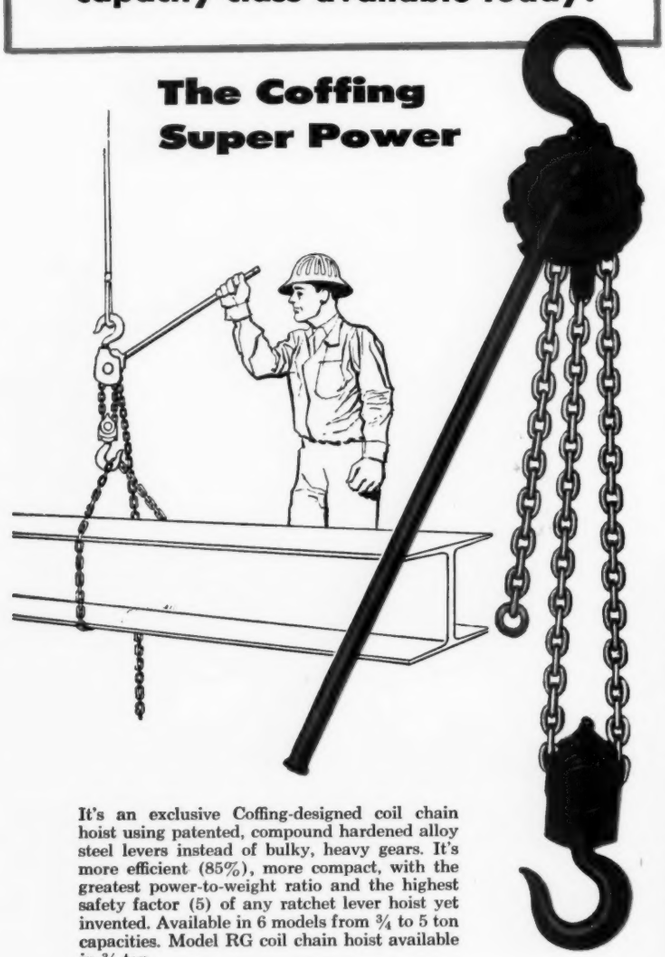
Drilling of this limestone rock is being done with wagon drills and a Joy 4-inch drill. Ingersoll-Rand and Gardner-Denver wagon drills are mounted on Air Trac self-propelled carriages. The Air Tracs not only carry the drills, but also move the compressors from place to place on the quarry floor. The wagon drills use 2¼-inch Rok-Bits and other makes of carbide-insert drills. An Ingersoll-Rand 600-cfm Gryo-Flo compressor, supplemented by other units, power these drills.

The Joy drill is mounted on the rear of a Euclid truck chassis, which also carries the Ingersoll-Rand Gyro-Flo 600 compressor operating the drill. Using 4-inch Rok-Bits, the big drill works a face 20 to 40 feet deep. The average depth of holes drilled by the wagon drills is about 12 feet.

Blast holes drilled in grid pattern, are spaced from 7 to 24 feet in each direction, depending on their depth and the type of drill, and loaded with Hercules Gelamite No. 2 or equivalent

This hoist is the most efficient lightest, safest hoist in its capacity class available today!

The Coffing Super Power



It's an exclusive Coffing-designed coil chain hoist using patented, compound hardened alloy steel levers instead of bulky, heavy gears. It's more efficient (85%), more compact, with the greatest power-to-weight ratio and the highest safety factor (5) of any ratchet lever hoist yet invented. Available in 6 models from ¾ to 5 ton capacities. Model RG coil chain hoist available in ¾ ton.

"Safety valve handle" bends at point of maximum safe overload—may be adjusted for length and operated from either side of the hoist—can't spin out of control should operator's hand slip from handle. Every hoist must withstand the shock of its capacity load dropped in increments of 1" thru 4", an impact load of well over 5 to 1. Ask your Coffing distributor for literature or write for bulletin SP, Coffing Hoist Division, Duff-Norton Co., 810 Walter Street, Danville, Ill.

COFFING HOISTS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 272

Anthes
FLAME-GUARD
the torch with the
SQUARE BURNER
NEW!
Construction Torch
Designed and constructed by Anthes, a firm famous for torch and flare equipment in the trucking industry. Here is a unit that is leak-proof, self-righting, long-burning—and ruggedly made to perform faithfully under the most adverse weather conditions. Baked enamel body and burner. Chain for carrying. Write for complete data and prices. Anthes Force Oiler Co., Ft. Madison, Ia.
ANTHES
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ANTHES FORCE OILER CO
FT. MADISON IA. U.S.A.
Anthes
WEATHERCAP
The protector of engines with vertical exhaust pipes
Areas open for distributors.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 273

dynamites in sticks of 1½ × 8 inches and larger.

Rock loosened by blasting is loaded by a Bucyrus-Erie 54-B shovel into two end-dump Euclids that haul to the feeder of the Allis-Chalmers 42-inch gyratory crusher set up at one edge of the quarry. This primary crusher, powered by a 250-hp electric motor, reduces all of the material to 7-inch-minus size. A Conveyco 48-inch belt conveyor takes the rock from the primary crusher and delivers it 250 feet to the number 1 stockpile.

Conveyor carries rock

Two 36-inch Conveyco belt conveyors carry the material 4,000 feet down the mountain from the number 1 stockpile to the number 2 surge pile. The long conveyor is driven from the center by a 125-hp geared-head electric motor. Between the number 1 and number 2 stockpiles, the material passes through a Yuba trommel screen. This 8 × 35-foot scrubber, fed with water at a rate of 2,000 gpm, removes dirt and dust from the rock.

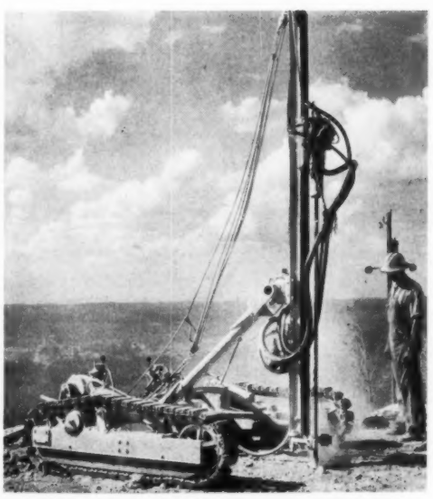
Another 36-inch belt, this one 1,400 feet long, picks up the rock from the number 2 surge pile and delivers it to the top of the screening tower of the processing plant. This conveyor dips down through a valley, and a steel trestle elevates it over the main access road to the plant.

The screening, crushing, and sand-producing plant is basically a Conveyco plant, and many of the belt conveyors in the system are made by Conveyco. Rock delivered to the plant goes first to a 5 × 12-foot two-deck Allis-Chalmers screen that separates the finished 6-inch rock. Over-size goes to an Allis-Chalmers 48-inch gyratory crusher, and minus-3-inch goes to the next screen. This screen takes the finished 3-inch rock off, sends any over-size to a crusher, and passes the minus-1½-inch to the next screen.

The Number 3 screen separates the finished 1½-inch rock and the ¾-inch rock. Some of the ¾-inch-plus rock and the finer material goes to an Allis-Chalmers 530 cone crusher and

(Concluded on next page)

The 7-inch-minus material crushed at the quarry and delivered to the No. 1 surge pile at the top of the hill travels 4,000 feet by 36-inch conveyors to the Yuba trommel screen or scrubber. *C&E Staff Photo*

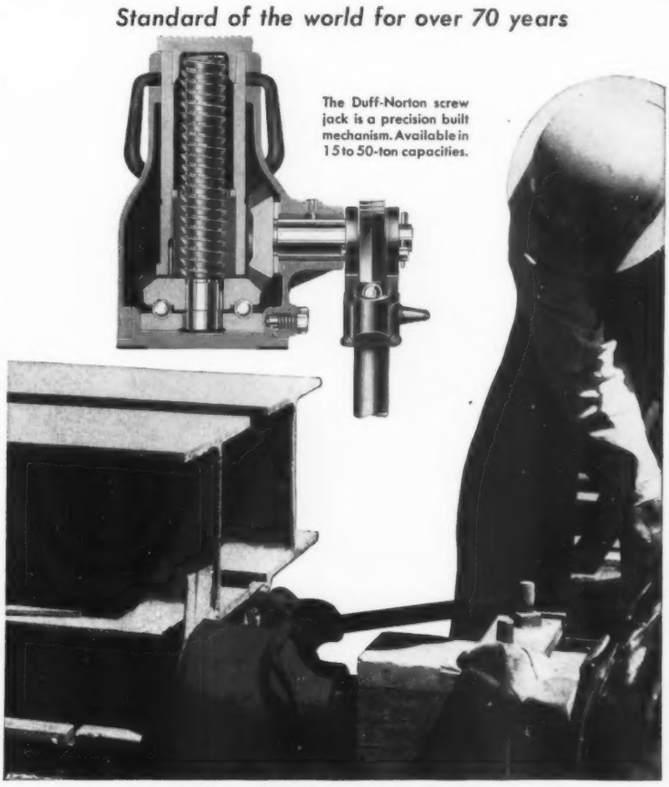


▲ A blast hole is put down in the Baird Mountain quarry just to the south of Table Rock Dam by an Ingersoll-Rand drill. The drill is mounted on an Air Trac that also pulls an I-R Gyro-Flo 600-cfm compressor. *C&E Staff Photo*

Duff-Norton

Ball Bearing Screw Jacks can't creep or drop— will hold loads indefinitely

Standard of the world for over 70 years



The Duff-Norton screw jack is a precision built mechanism. Available in 15 to 50-ton capacities.

Can be used upright or on side with equal efficiency—no fluids to leak, no air to "lock."

Duff-Norton Ball Bearing Screw Jacks, employing the basic inverted nut and screw principle, are locked in position when under tension, can't move up or down unless you insert the jack handle and apply hand power to ball bearing actuated gears in base that turn the nut. They are safe, foolproof, dependable, fully enclosed, rugged—*seldom need lubrication or servicing.*

For complete specifications on various capacities and name of your nearest recognized distributor, write the world's oldest and largest manufacturer of lifting jacks, the Duff-Norton Co., P. O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-12-L.

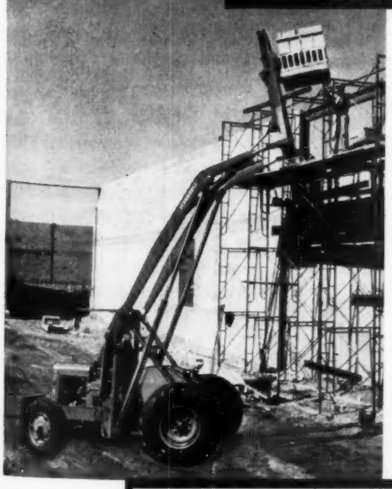
DUFF-NORTON

"Giving Industry A Lift Since 1883"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 275

automatic self-leveling?

the* ECONMOBILE *600 LOADER has it!



The ECONMOBILE's integral automatic self-leveling feature is only one of many that already have made this high-lift, hydraulic loader a favorite of the construction world.

Consider these factors: The ECONMOBILE's lift of 18 feet —or 22 feet with auxiliary tower; its reach of up to 6 feet from wheel to heel; its mobility and speed; its 90% use factor with a wide range of attachments.

It's not surprising that one contractor reported his ECONMOBILE served 68 masons with only 8 general laborers.

write, wire or call

AMERICAN ROAD EQUIPMENT COMPANY
4310 North 28th Street Omaha, Nebraska
Phone PLeasant 2575

For more facts, use Reader-Reply Card opposite page 18 and circle No. 274

Aggregate from the No. 2 surge pile at the end of the scrubber is taken to the top of the screening plant in the distance by a 1,400-foot conveyor that runs on a steel trestle over the access road to the plant.

(*Continued from preceding page*)

a Symons cone crusher producing ¾-inch-minus, which is used in producing sand and ¾-inch aggregate.

Three of the four sizes of finished rock are taken from the screening plant by belt conveyors and delivered to three of four large Armco steel bins for storage and cooling. One of these is 32 feet in diameter and 42 feet high, the other two are 36 feet in diameter and 45 feet high. Precooled air from the refrigerating plant passes through aggregates in these tanks to cool the material. Jeffrey vibrating pan feeders in the bottom of the tanks deliver the aggregates, as required, to the recovery conveyor leading to the concrete plant.

For more facts, circle No. 277.

The ¾-inch-minus material from the screening plant is delivered by conveyor to the sand plant. Here, after the ¾-inch aggregate is scalped and sent to a bin similar to the 32 × 42 storage and cooling bin, a pair of Marcy rod mills reduce the material to a still smaller size. One of these rod mills is 5 × 11 feet, the other 6 × 12 feet. Material coming from the rod mills goes to a Conveyco sand-classifier tank and vacuum sand wheel so that water and fines can be removed.

Two sizes of sand, No. 4 to No. 16, and minus No. 16, are produced. The finished sand goes to a radial stacker conveyor that stockpiles the material over the recovery tunnel leading to the concrete plant. THE END

One-man-operated Etnyre "Black-Topper" applying special bituminous material.

Etnyres provide high distribution standards for Knight Paving Products, Inc.

High-type pavements at low cost are now being built by Knight Paving Products, Inc., Rochester, N. Y., one of the largest bituminous materials suppliers in New York State. Distribution of Asphaltar, using low-cost local aggregates, is made with Etnyre "Black-Toppers" to maintain the very highest distribution standards.

Says Mr. Victor H. Pillen, General Superintendent: "Most of our work is done for states, counties, cities, towns, or villages. The very highest distribution standards must be constantly maintained, and this is the main reason we have always used Etnyres exclusively. Our daily operations require the distribution of all standard types and grades of bituminous materials in addition to several customized types and grades, yet we have never had to adjust pump clearances, change spray nozzles, or make any other time-consuming change on our Etnyres in spite of this diversity of products."

Get latest data and prices now on the distributor that gives you greatest value for your dollar. See your nearby Etnyre dealer or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

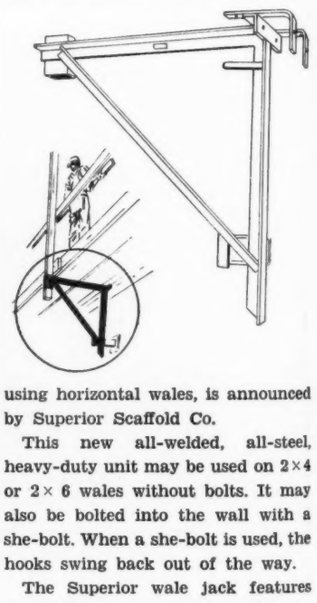
SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 276

Improved jack for use with horizontal wales

■ Introduction of an improved wale jack, designed especially for use on bridges, dams, abutments, and other types of concrete construction jobs



using horizontal wales, is announced by Superior Scaffold Co.

This new all-welded, all-steel, heavy-duty unit may be used on 2 × 4 or 2 × 6 wales without bolts. It may also be bolted into the wall with a she-bolt. When a she-bolt is used, the hooks swing back out of the way.

The Superior wale jack features double-hook construction at the top. According to the manufacturer, this insures a rugged, safe grip, distributes the load evenly, and makes sidesway impossible.

For further information write to Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif., or use the Request Card at page 18. Circle No. 3.

Caissons; piling

■ Drilled caisson foundations are pictured and described in a folder from the Caisson Corp. With truck-mounted caisson drilling equipment it is now possible to provide caisson-type foundations, with or without belled bottom, and with diameters of shafts from 12 inches to 7 feet, at relatively low cost, according to the literature. Concrete pile, belled caisson, drilled-in and angle-drilled foundations are pictured. A chart lists caisson diameters in feet and inches, together with the volume per cubic foot drilled.

To obtain this folder write to the Caisson Corp., 4900 Main St., Skokie, Ill., or use the Request Card at page 18. Circle No. 23.

Convention Calendar

April 11–13 South Dakota Highway Short Course

Short Course of Instruction, Union Building, South Dakota State College, Brookings, S. Dak. Emory E. Johnson, professor of civil engineering, Department of Civil Engineering, South Dakota State College.

April 12–14 American Concrete Agricultural Pipe Association

Sixth Annual Meeting, Brown Palace Hotel, Denver, Colo. Howard F. Peckworth, managing director, ACAPA, 228 N. LaSalle St., Chicago, Ill.

April 13–14 Texas Aggregates Association and Texas Ready Mixed Concrete Association

Joint Annual Convention, Statler Hilton Hotel, Dallas, Texas. Ray L. Cain, executive secretary, TAA, 201 Perry-Brooks Bldg., Austin, Texas.

April 16–20 Greater New York Safety Council

Twenty-sixth Annual Safety Convention and Exposition, Statler Hotel, New York, N. Y. Paul F. Stricker, executive vice president, GNYSC, 60 E. 42nd St., New York 17, N. Y.

April 23–25 American Wood Preservers Association

Meeting Jung Hotel, New Orleans, La. W. A. Penrose, secretary-treasurer, AWPA, 839 17th St. N. W., Washington 6, D. C.

May 4 Maryland Association of Engineers

Meeting, Southern Hotel and Rolling Road Golf Club, Baltimore, Md. Louis B. Kravetz, executive secretary, 314 Municipal Office Bldg., Baltimore 2, Md.

May 8–10 Highway Transportation Congress

Sixth Annual Transportation Congress, Hotel Mayflower, Washington, D. C. Arthur C. Butler, director, National Highway Users Conference, National Press Building, Washington 4, D. C.

May 11–12 Michigan Engineering Society

Annual Meeting, Pantlind Hotel, Grand Rapids, Mich. D. B. Apted, secretary, MES, 945 San Lucia Drive, Grand Rapids, Mich.

May 17–19 New York State Society of Professional Engineers

Convention and Thirtieth Engineering Industries Exposition, Hotel Statler, New York, N. Y. Harold Becher, P. E., chairman, Publicity Committee, NYSSPE, 1941 Grand Central Terminal, New York 17, N. Y.

May 20–22 Building Research Institute

Annual Meeting, Sheraton-Brock Hotel, Niagara Falls, Ontario, Canada. William H. Scheick, executive director, BRI National Academy of Sciences, 2101 Constitution Ave. N. W., Washington 25, D. C.

May 21–24 Pan American Convention of International Road Federation

Meeting, San Salvador, El Salvador, C. A. Robert O. Swain, executive director, Pan American Convention, IRF, 1023 Washington Bldg., Washington 5, D. C.

May 23–25 National Society of Professional Engineers

Meeting, Ambassador Hotel, Atlantic City, N. J. Paul H. Robbins, executive director, NSPE, 1121 15th St. N. W., Washington 5, D. C.

May 28–30 Wire Reinforcement Institute, Inc.

Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington, D. C.

May 28–June 2 Concrete Reinforcing Steel Institute

Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. H. C. Delzell, managing director, c/o CRSI, 38 S. Dearborn St., Chicago 3, Ill.

June 4–8 American Society of Civil Engineers

Meeting, University of Tennessee campus, Knoxville, Tenn. Don H. Mattern, general chairman, ASCE, 513 Union Bldg., Knoxville, Tenn.

June 4–7 Material Handling Institute and Material Handling Show

Meeting, Public Auditorium, Cleveland, Ohio. R. K. Hanson, managing director, MHI, 813 Clark Bldg., Pittsburgh 22, Pa.

June 17–22 American Society for Testing Materials

Fifty-ninth Annual Meeting and Twelfth Apparatus Exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

June 18–20 School for Highway Superintendents

Course of Instruction, Cornell University, Ithaca, N. Y. Professor J. W. Spencer, highway research and extension engineer, Department of Agricultural Engineering, Cornell University.

June 25–27 American Society of Landscape Architects

Meeting, Hotel Cleveland, Cleveland, Ohio. Ernest L. Dewald, general chairman, ASLA, 12910 Fairhill Road, Shaker Heights 20, Ohio.

June 25–29 American Society for Engineering Education

Meeting, Iowa State College, Ames Iowa. W. Leighton Collins, secretary, ASEE, University of Illinois, Urbana, Ill.

Universal Atlas to start erection of new facility

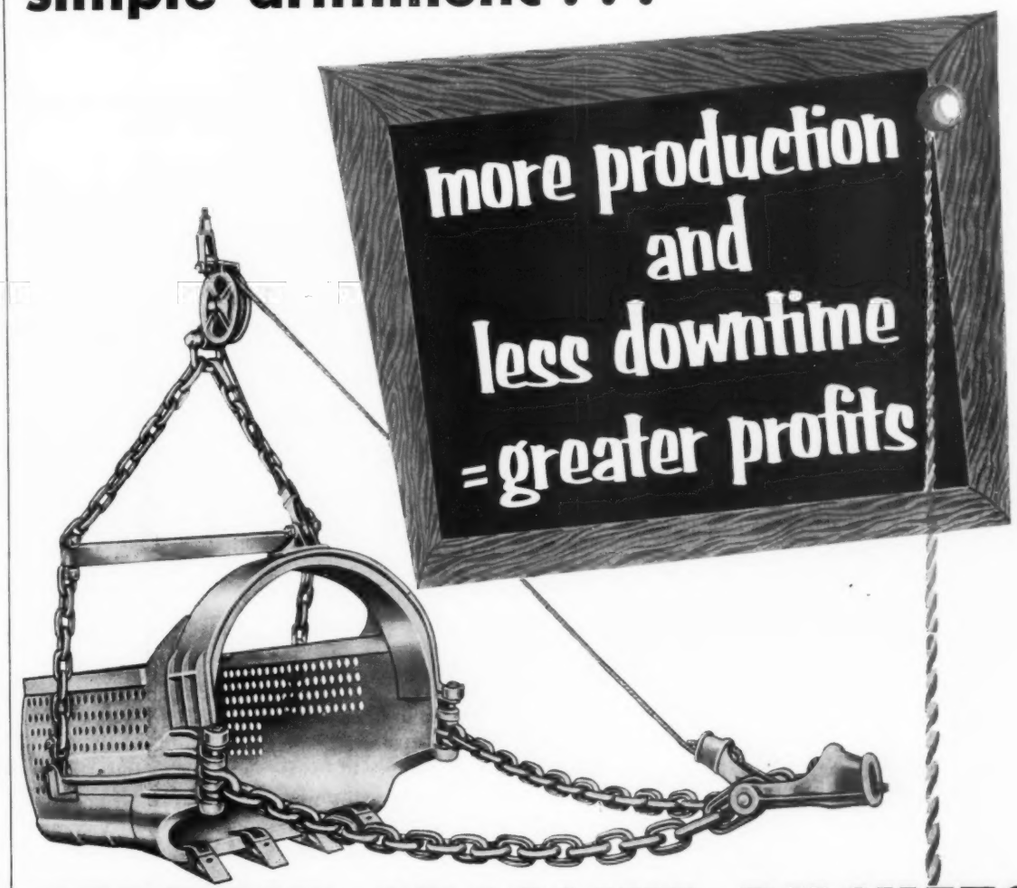
Work has begun on a fourth rotary kiln and its supporting facilities at a site in Hudson, N. Y., for the Universal Atlas Cement Co., New York, N. Y. Scheduled for completion in 1957, the facility is being constructed by the Rust Engineering Co., Pittsburgh, Pa.

Torque control improves nut-running tool

■ Ingersoll-Rand's air-operated new torque-control Impactool for nut-running impacts a nut to a desired preset torque, and then automatically shuts itself offf, according to a new I-R catalog. Two models offered have a maximum torque ranging from 60 to 550 foot-pounds. This new unit reduces the four-man riveting team to two. A list of other advantages includes positive torque control, simple and constant torque setting, no clutch, and full power in either direction.

To obtain Form 5170 write to Ingersoll-Rand, 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 153.

simple arithmetic . . .



HENDRIX DRAGLINE BUCKETS

assure greater output at lower cost

It's simple Arithmetic! Hendrix Buckets are built for trouble-free performance, day in and day out. This . . . plus a maximum load every trip . . . assures BIGGER PROFITS on every operation.

A TYPE FOR EVERY DIGGING PURPOSE
¼ to 40 Cubic Yards

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 278

Hydraulic drill unit fits tractors, trucks

■ The newest unit in the Mobile Drilling line is the hydraulically powered Model B-40, a unit engineered to operate as either a core or auger drill. It may be adapted for use mounted on a tractor or other vehicle, or independently driven by a motor mounted at the rear of a vehicle.

For hard formations, either air or water may be used with hollow-stem augers. The drill cores to 200 feet and augers to 75 feet, using 5-foot sectional augers. A 15-hp hydraulic motor is geared to high-torque low speeds and assures a positive, steady drill action.

Said to be ideal for under-road boring as well as nearly every exploratory job, the B-40 is also recommended for cutting costs on installation of underground water, gas, and power lines. One-man operated, it can be converted easily to drill at any angle in a 360-degree range. The unit fits on the back of any vehicle, and is light enough for air transport to remote areas.

The new Mobile Drilling Model B-40 fits on the back of any vehicle.

For further information write to Mobile Drilling, Inc., 960 N. Pennsylvania St., Indianapolis 4, Ind., or use the Request Card at page 18. Circle No. 81.

Nylon, duck tarpaulins

■ Tarpaulins made of number duck and nylon are recommended for enclosing work on buildings in bad weather, protecting machinery and materials, and as covers for trailer-trucks, are shown in a catalog from the manufacturer, Hoosier Tarpaulin & Canvas Goods Co., Inc. These flame, water, acid, alkali, oil, and grease-resistant tarpaulins come equipped with grommets and 3-foot tie ropes every 2 feet. Data included lists cut sizes—from 6×8 to 20×40—and prices of the light, medium, heavy, and extra heavy-duty types.

To obtain Catalog 56-W1 write to Hoosier Tarpaulin & Canvas Goods Co., Inc., 1302–10 W. Washington St., Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 97.

Announce redesigned line of rod and wire cutters

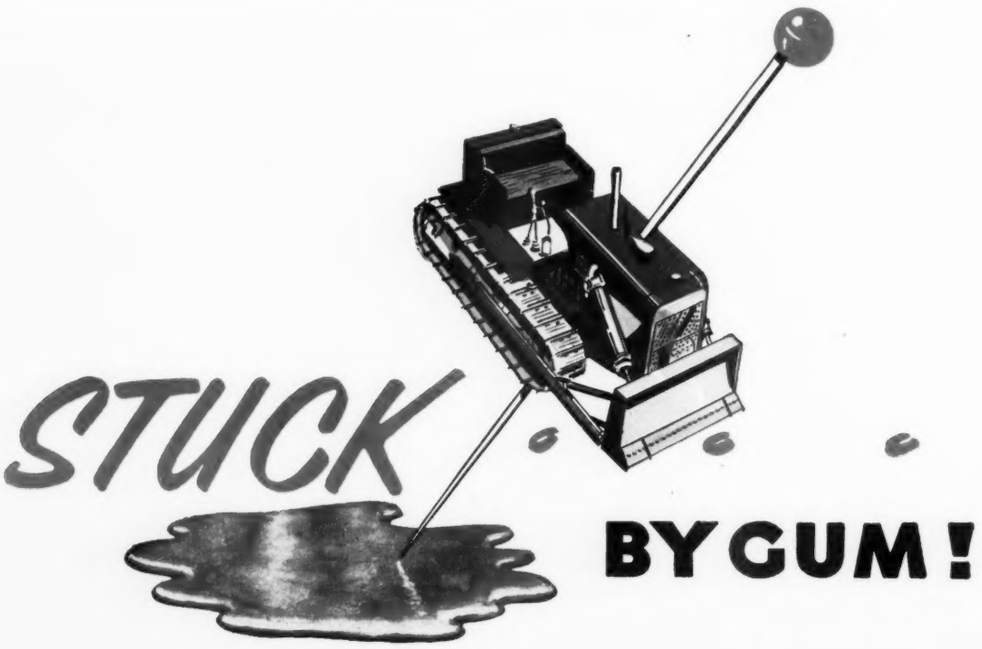
■ The Manco Mfg. Co. has announced that its line of high-speed Guillotine cutters has been completely re-engineered for better performance, with particular emphasis on low maintenance cost.

A new valve design providing substantially greater capacity is said to give a faster operating cycle. For low maintenance the number of operating parts has been reduced, and parts are now hardened and ground. A new seal assembly permits easy replacement as a unit. A further innovation is the interchangeable blade and anvil, as a result of which, wear points can be reversed for virtually double blade life. Three blade styles are offered for cutting various types of material.

The Model MC-210, one of the three newly designed Manco hydraulic rod and wire cutters.

The new hydraulic cutters, according to the manufacturer, are ideal for production cutting of coiled wire, trimming off cobbled ends, taking test samples, and splitting bundles. Three models are available: the MC-210, with ½-inch-diameter capacity and an operating cycle of ½ second per cut; the Model MC-35, which cuts 1-inch-diameter steel in 1¼ seconds; and the Model MC-65, which cuts 1¼-inch-diameter steel in 2 seconds. The units are powered by a Manco 5-hp Series H Hi-Thrust electric hydraulic pump.

For further information write to the Manco Mfg. Co., Bradley, Ill., or use the Request Card at page 18. Circle No. 82.



A Complete Line of *wix* HEVI-DUTY OIL FILTER CARTRIDGES

for both Fuel and Lube Oil applications and for Full-Flow and By-Pass systems. There are WIX Cartridges designed especially for

CATERPILLAR **LE TOURNEAU**
EUCLID **MURPHY**
LE ROI **INTERNATIONAL**
ALLIS-CHALMERS

and all other mobile and stationary Construction Equipment.

Your operating costs go up fast when your construction equipment is pinned down—on the job or in the shop—by clogged fuel injectors, scored cylinders and worn bearings. The common cause of these troubles is the grit, dirt and gummy sludge picked up by fuel and lube oil under rugged, construction service conditions. The thrifty cure . . . prevention . . . is WIX Engineered Filtration.

WIX provides a *complete* Line of top-quality, HEVI-DUTY Oil Filter Cartridges for *every* filter-equipped engine . . . gasoline or Diesel, fuel or lube oil . . . trucks, earthmovers, stationary engines and passenger cars. WIX surveys your filtration needs FREE, sets up a time-saving Inventory-Control System tailor-made to your needs, and provides a back-up supply of every Cartridge you use, carried by your local WIX Wholesaler to give you immediate service. Ask for your FREE Survey and complete details on cost-cutting WIX Engineered Filtration Service.

FREE:
Survey of Filters on Your Equipment and Permanent Inventory Cards to save you time, money and trouble!

Call your nearest WIX Jobber, or write direct, today!

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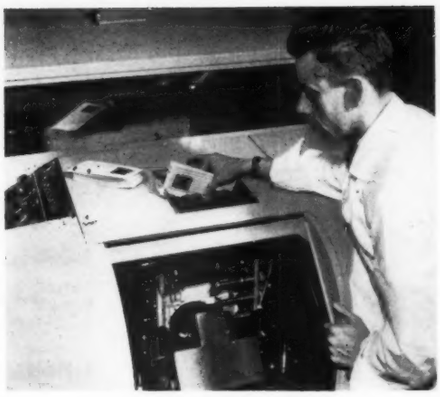
OIL FILTERS CARTRIDGES
WIX CORPORATION . GASTONIA . N. C.
In Canada: Wix Accessories Corp. Ltd., Toronto

For more facts, use Reader-Reply Card opposite page 18 and circle No. 279



The new RCA automatic dry-process enlarger-printer takes up to 500 individual microfilm exposures of engineering drawings.

New dry-process enlarger makes 15 prints a minute

■ A new type of dry-process enlarging printer, capable of reproducing 15 standard-size engineering drawings a minute from microfilm originals, has been developed by RCA. It is said to be the first commercially-designed machine to utilize the RCA-developed Electrofax dry-photographic process.

The machine is designed for use with the Dexter Filmsort system—a comparatively new method for filing and selecting drawings for reproduction. Filmsort utilizes individual exposures of drawings or microfilm. Each exposure or microfilm frame is mounted on a separate electric accounting machine card. The cards may be selected quickly according to category by conventional electric punch-card machines.

The Electrofax machine also processes 35-mm roll microfilm in standard 100-ft reels. The microfilm originals—cards or roll—are fed into the machine's lens system at a rate of one frame every four seconds. A load of 500 frames can be processed in 35 minutes to obtain 500 C-size (17×22-inch) reproductions. Up to 24 multiple copies of each frame can be reproduced.

RCA points out that its new enlarger-printer will eliminate the need for storing full-size originals and permits the centralization of engineering drawings in a master file. No darkroom or special protective lighting for location or processing is required. Operation, for the most part, is by means of easily manipulated push buttons.

For further information write to Radio Corporation of America, Bldg. 15-1, Front and Cooper Sts., Camden 2, N. J., or use the Request Card at page 18. Circle No. 125.

Work signs, barricades

■ Barricades, and detour signs and the points at which they should be placed are discussed in literature from the Liberty Mutual Insurance Co. Diagrams of urban, rural, and temporary run-around detours point out the proper sign to be used. Other topics discussed include approaches, construction areas, speeds, fly rock, and blasting.

To obtain this literature, write to Liberty Mutual Insurance Co., 175 Berkley St., Boston, Mass., or use the Request Card at page 18. Circle No. 20.

Market new barrier film for construction field

■ Gering Products, Inc., Kenilworth, N. J., has announced the availability of a new extruded polyethylene moisture-vapor barrier film, called Ger-Pak, for use in the light and heavy construction fields.

Ger-Pak is recommended for use as a moisture-vapor barrier under concrete slabs, in crawl spaces around the exterior of foundation walls, and over subflooring and on the warm side of walls as a dust barrier. According to the manufacturer, it will not embrittle with age, crack, chip, or peel, and is highly resistant to most known chemicals.

Comparatively light in weight (2,000 square feet weighs less than 40 pounds), Ger-Pak is available in widths up to 20 feet; thicknesses of 0.002, 0.004, and 0.006 inches and heavier; in black or transparent.

For further information write to the company, or use the Request Card at page 18. Circle No. 106.

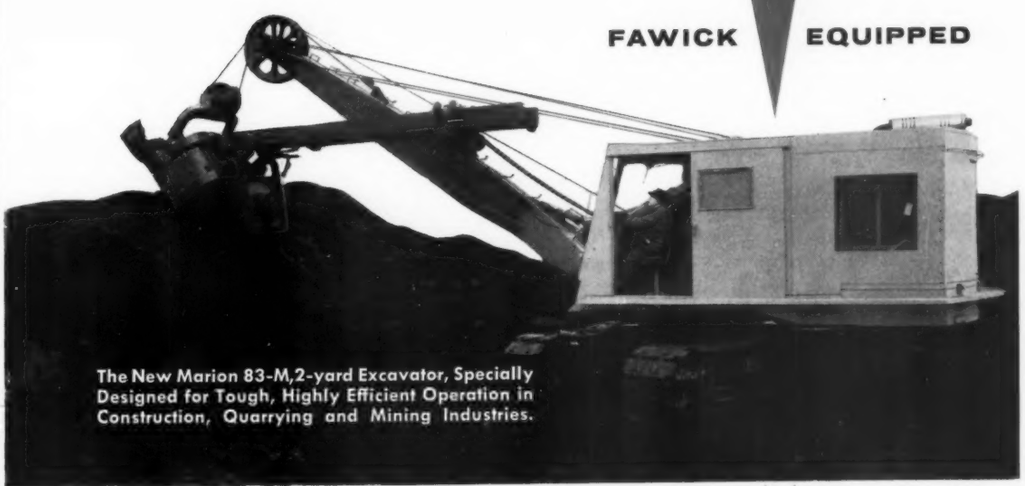
Truck-trailers

■ A folder features the Autocar diesel truck manufactured by the Autocar Trucks Division of White Motor Co. Cutaway pictures show the double-reduction rear axle, six-wheel chassis, diesel engine, transmission, and driver cab.

To obtain this folder write to Autocar, Division of the White Motor Co., Exton, Pa., or use the Request Card at page 18. Circle No. 28.

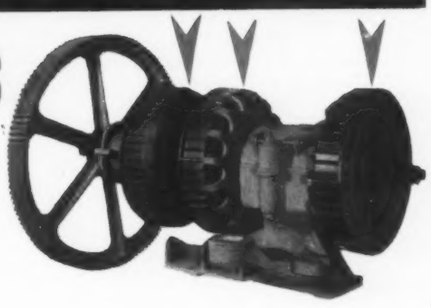
FAWICK *Products in Action* IN THE EARTHMOVING INDUSTRY

FAWICK EQUIPPED



The New Marion 83-M, 2-yard Excavator, Specially Designed for Tough, Highly Efficient Operation in Construction, Quarrying and Mining Industries.

taking 3-ton bites with top efficiency!



Swing Shaft Assembly for the Type 83-M Marion Excavator. Includes Two Fawick 27VE475 Fully-Ventilated Air-ring Swing and Propel Clutches and Fawick 27E475 Air-ring Crowd-Retract Clutch.

Marion Power Shovels, known the world over for their ability to handle efficiently all types of materials, utilize FAWICK Airflex Clutches to provide positive and smooth control in their various operations. FAWICK air-actuated clutches contribute to the fast, accurate operation of Marion 362, 43-M, 83-M, 87-M, and 111-M machines.

These clutch installations demonstrate the versatility of FAWICK Clutches, which produce positive, fast, simple-control clutch action on all types of equipment, and reduce maintenance and machine down-time to a minimum.

Call or write the nearest FAWICK representative or the Home Office and we will gladly show you the advantages FAWICK products will provide for your specific equipment.

FAWICK AIRFLEX DIVISION
FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO
In Canada: Fawick Canada, Ltd., Toronto, Montreal

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

Field Offices and Representatives in principal cities

For more facts, use Reader-Reply Card opposite page 18 and circle No. 280

Heavy-duty truck line boasts 40 2½-ton units

■ Announcement of 40 new hauling giants having up to nearly double the capacity of any truck previously produced by the company marks Chevrolet's invasion of the heavy-duty truck field.

The new vehicles, all in the 2½-ton class, are in addition to a lighter series, covering ½ to 2-ton models, already announced. Capacities of the new models range up to 32,000 pounds maximum gvw and 50,000 pounds gross combination weight.

Significant features of the new line include Chevrolet's first offering of tandem-axle equipment as production options, the most powerful truck engine ever featured by the company,

and a new automatic transmission—Powermatic—said to promise greater safety and control of heavily loaded vehicles.

One of eight transmissions available on the 1956 trucks, Powermatic automatically determines a shift schedule through six closely-stepped ratios. The driver may also operate a selector to three speed ranges—drive for normal work, intermediate for hilly country or heavy traffic, and low for traction or controlled power. Power take-off openings for installation of special equipment are provided on both sides of the unit for the first time in any automatic transmission, according to the manufacturer.

With a new 322-cubic-inch V8—the Loadmaster—Chevrolet's truck engine choices this year total ten: five V8's and five "6's." The company's most powerful truck engine thus far, the Loadmaster, generates 195 horsepower and has a 0.8 to 1 short stroke-to-bore ratio, featuring economical and low piston travel per mile, which is said to ideally fit it for heavy-duty trucks on which it is standard equipment. Stroke is 3.2 inches, bore 4 inches, and compression ratio 7.7 to 1.

The new 2½-ton trucks have distinctive fender and grille design. Heavy-duty frames are of a new, more rugged parallel-type construction, while those on tandems are even sturdier. Heavier-duty brakes and steering have been designed for the new units. A new Chevrolet option for 1956 is the air-over-hydraulic brake for 2 and 2½-ton models. Other new features are tubeless tires, improved sealed-beam headlamps, and better electrical systems. Automatic transmissions are optional for all models.

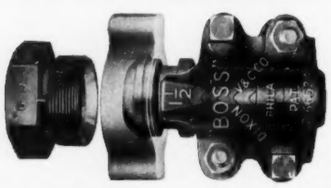
For further information write to Chevrolet Motor Division, General Motors Corp., General Motors Bldg., Detroit 2, Mich., or use the Request Card at page 18. Circle No. 66.

Littleford appoints

Littleford Bros., Inc., Cincinnati, Ohio, has appointed William Bramlage manager of advertising and sales promotion of the firm's blacktop, roadbuilding, and metal fabricating.

Safest Connections for Pile Driver Hose
AND OTHER STEAM, AIR, WATER AND HYDRAULIC APPLICATIONS

"GJ-BOSS"
GROUND-JOINT FEMALE COUPLING
STYLE X-34



The original *washerless* coupling that is unequalled for *safety* in every high pressure service, and will therefore serve with exceptional efficiency and economy on all low-pressure applications. Built to withstand hard use and rough handling. Ground-joint union between stem and spud provides leak-proof, trouble-free seal...no lost or worn-out washers to replace. All parts malleable iron or steel, thoroughly rustproofed. Furnished with super-strong "Boss" Offset and Interlocking Clamps. Sizes ¼" to 6", inclusive.

COMPANION MALE COUPLING
"BOSS", STYLE MX-16

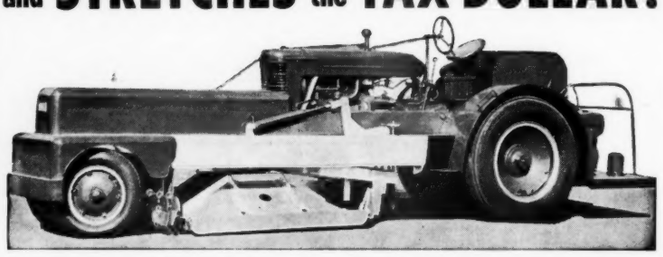
Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Will prove equally efficient and economical for all applications where standard iron pipe nipples are normally used. Each size fits same size hose . . . oversize hose not required. Coupling consists of I.P.T. male stem and "Boss" Offset and Interlocking Clamp. Steel or malleable iron, thoroughly rustproofed. Sizes ¼" to 6", inclusive.

Stocked by Manufacturers and Distributors of Mechanical Rubber Goods

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO. LTD. TORONTO Associate Companies

For more facts, circle No. 281

• heats,
• planes,
• renews the asphalt . .
and STRETCHES the TAX DOLLAR!



The MONATCO Asphalt HEATER-PLANER

thoroughly heats and softens the asphalt sheet, *without incinerating it.* In the same operation, planes off washboard corrugations, bleeding or fat—fills ruts and seals cracks with preheated material. Leaves a perfectly conditioned, raw, clean surface, the same as on newly laid pavement. Has proved itself on asphalt highways, streets, runways, all over the nation—not only for fast and effective maintenance—but for outstanding low cost of operation, in many cases reported as *less than 10¢ per square yard!*

OPERATED BY ONE MAN
(no special skill required)
MAINTAINS HEAT of 2000° F. under the hood
—on standard No. 2 Fuel Oil
NO SMOKE

The only machine of its kind—protected by U. S. Patent No. 2,705,906

Manufactured by MONATCO MFG. CORPORATION
1401 Woodland, Kansas City, Mo.
Write for complete specifications and cost operating data. A few choice distributorships still available.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 282

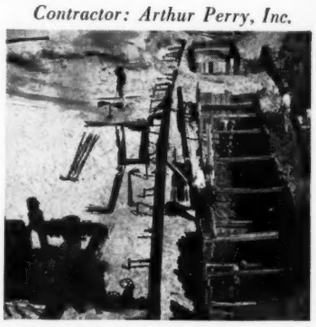
HOW TO HANDLE WET JOBS

33 of a Series

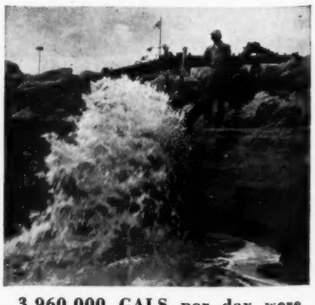
NEW SEA LIFE HOME FOR MARINE STUDIOS

Marineland, Fla.

Contractor: Arthur Perry, Inc.



50 POINTS, 240-ft header: What volume could be handled by a well-point system of such size, working in very coarse water-bearing sand just a few ft from the ocean? Answer below.



3,960,000 GALS per day were pumped round-the-clock for the life of the job—this entire flow handled by one Griffin Vac-u-matic wellpoint pump.

SUCH exceptional drainage volume—it's 55 gals per minute for each point—will surprise many contractors. Others know from repeated experience the superiority and efficiency of the Griffin system.

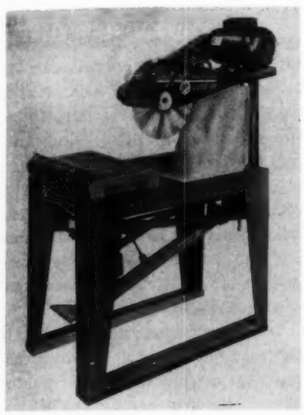
GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

For more facts, circle No. 283

Heavy-duty masonry saw with extra power factor

■ A new heavy-duty masonry saw with a full 2-horsepower continuous-duty motor developing up to 4.2 horsepower under load conditions is offered by Cardinal Engineering Corp. The unit is recommended for wet or dry cutting on brick, block, tile, and other types of hard and soft masonry materials.

The design of this saw is said to be unique in that the head may be raised or lowered to any desired fractional part of an inch, within a 20-inch range. A micrometric adjustment on



the cutting angle of the head permits precise regulation. All operating adjustments are made at the front of the saw rather than from the front, rear and underneath, as on many conventional saws.

The unit is also equipped with an adjustable regulator for hard and soft materials, a locking position for cutting on production runs, and a quick voltage change-over feature. The main assembly is fabricated from heavy-gage all-welded steel, with a cutting cart of featherweight aluminum.

For further information write to Cardinal Engineering Corp., 144 Burnside St., Philadelphia 27, Pa., or use the Request Card at page 18. Circle No. 86.

Equipment trailers

■ Equipment trailers in 6, 8, and 10-ton capacities are described in a bulletin from Miller Research Engineers. Complete details and specifications of of these Tilt-Top single and tandem-axle trailers are given. Operating features of the trailers are diagrammed.

To obtain this bulletin write to Miller Research Engineers, 450 S. 92nd St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 98.

L. B. Foster names two sales representatives

Two new sales representatives, William A. Stovall and Herbert E. Waterhouse, have joined the Atlanta, Ga., office of the L. B. Foster Co., Pittsburgh, Pa., supplier of steel sheet piling and pipe.

Mr. Stovall will specialize in buying and selling steel pipe. Mr. Waterhouse was formerly associated with the Atlantic Steel Co.

Spray gun operates on small compressor

■ A new, versatile spray gun designed and manufactured by The DeVilbiss Co., Toledo, Ohio, can be used where a limited amount of compressed air is available.

The P-CGA spray gun is quickly converted from a suction-feed gun to a pressure-feed-type tool, and can be used for a wide variety of spraying jobs in repair and maintenance shops. Relatively light in weight, the gun is easy to handle because of its balance. The handle is designed to provide a comfortable grip.

The gun is equipped with a one-quart metal cup. It is said to produce good spray-painting results even when operated from a compressor as small

as ¼ horsepower. Designed for long and trouble-free service, it has a pressure-cast aluminum gun body, stainless-steel fluid needle, and a hardened alloy-steel fluid tip.

For further information write to The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 55.

Water cans and coolers

■ A folder on water cans and coolers is available from the Egan Mfg. Co., El Dorado, Kans. The literature describes a full line of cans of from 1½ to 15-gallon capacities and water coolers of from 2 to 15-gallon capacities. Prices, shipping weights, and other information are included.

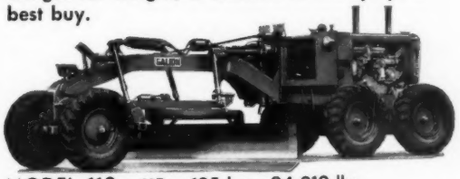
To obtain this folder, write to the Egan Mfg. Co., 306 S. Main St., El Dorado, Kans., or use the Request Card at page 18. Circle No. 113.

The Most Complete Line

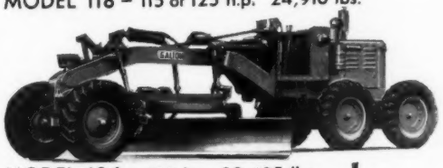
8 Models GALION MOTOR GRADERS

Most "PUSH-POWER" at the Blade

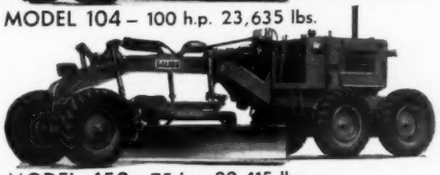
Galion Graders give you correct balance of weight, power, and blade pressures to produce maximum "push-power" at the blade—where power means most in moving more material in quicker cycles with least operator fatigue. Weight for weight, a GALION is always your best buy.



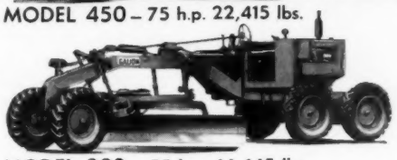
MODEL 118 – 115 or 125 h.p. 24,910 lbs.



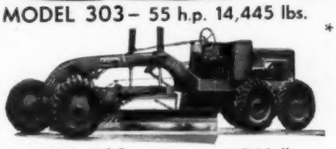
MODEL 104 – 100 h.p. 23,635 lbs.



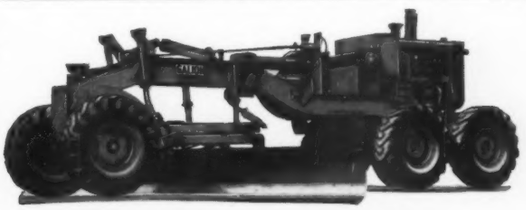
MODEL 450 – 75 h.p. 22,415 lbs.



MODEL 303 – 55 h.p. 14,445 lbs.

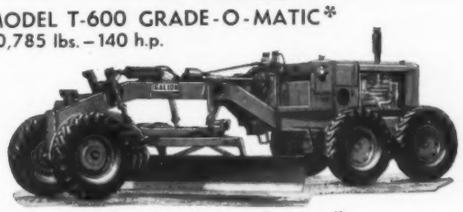


MODEL 503 – 50 h.p. 9,360 lbs.



MODEL T-700 GRADE-O-MATIC *
40,125 lbs. – 190 h.p.

MODEL T-600 GRADE-O-MATIC *
30,785 lbs. – 140 h.p.



MODEL T-500 GRADE-O-MATIC *
25,000 lbs. – 125 h.p.

* Galion GRADE-O-MATIC Graders utilize a Torque Converter with tail shaft governor and Power Shift Transmission

IT'S "PUSH-POWER" AT THE BLADE THAT COUNTS!

ESTABLISHED GALION 1907

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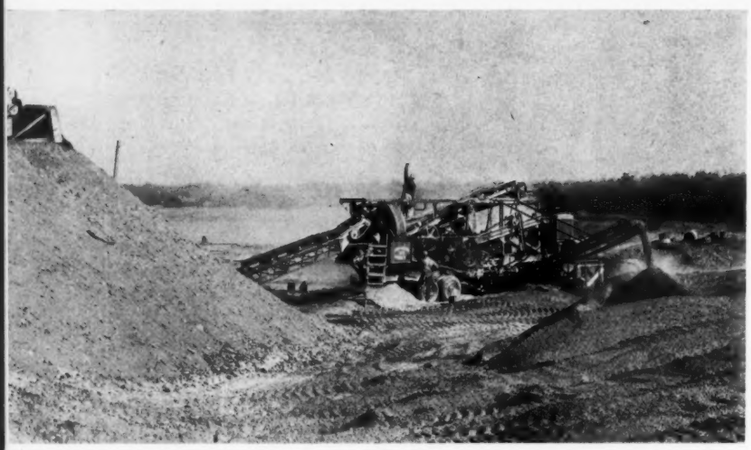
THE GALION IRON WORKS & MFG. CO.
GALION, OHIO, U. S. A.

THE GALION IRON WORKS & MFG. COMPANY
Dept. CE-46 Galion, Ohio, U.S.A.
Please send me literature on the Galion Motor Graders checked.

☐ Model T-700 ☐ Model T-600 ☐ Model T-500 ☐ Model 118 ☐ Model 104 ☐ Model 450 ☐ Model 303 ☐ Model 503

PERSON _____ TITLE _____
FIRM _____
STREET _____
CITY _____ STATE _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 284



This Austin-Western 101 rock-crushing plant, turning out 155 tons of material per hour, was set up in advance at the site so that an adequate stockpile of aggregate could be built up for the hot-mix plant.

High rock and hot-mix outpeeps

Contractor plans work so that hot plant operates continuously; 11,700 feet of hot-mix is laid daily in 10-foot-wide lane

After making sure that rock and asphalt plants were able to work at top capacity—and continuously—B. L. Gustafson, Phoenix, Ariz., went to work paving a new cutoff route between Buckeye and Gila Bend, Ariz., putting down as much as 11,700 feet of hot-mix on a 10-foot-wide 2½-inch-thick lane in a single shift. Hot-mix production, averaging 185 tons per hour, kept this fast paving spread on the move throughout the course of the entire job.

Grading was done under a separate contract for this project, which calls for a 40-foot paved surface requiring 38,000 tons of plant-mix, the production of 6 inches of select gravel, and 4 inches of aggregate base for the 14.6-mile stretch. Specifications for the aggregate base course were the same as those for the single-course hot-mix aggregate—1-inch minus down through 3 per cent of No. 200-mesh fines.

Rock produced fast

Select material from borrow areas previously designated by the Arizona State Highway Department was hauled to the roadway by Euclid single-power scrapers, which were loaded with the aid of an International pusher. Moving at times in excess of 30 mph, the Eucs brought the material to the site, and unloaded it in the 6-inch lift required. This material was a well-graded streambed alluvial soil, ranging in size from 3-inches down to No. 200. Lifts were watered, if necessary, and compacted by Buffalo-Springfield steel-wheel and Tampo pneumatic rollers.

Aggregate for the base course and plant mix was produced by an Austin-Western 101 rock plant equipped with a 10×36 jaw crusher, a set of 18×42 rolls, and a 4×12-foot double-deck screen. The plant was driven by a Caterpillar 275-hp D337 diesel, supercharged for high horsepower output. Since it had a capacity in the 155-ton-per-hour range for this material, the plant was set up about two weeks before the hot plant was installed, so that a supply of crushed and screened rock could be built up.

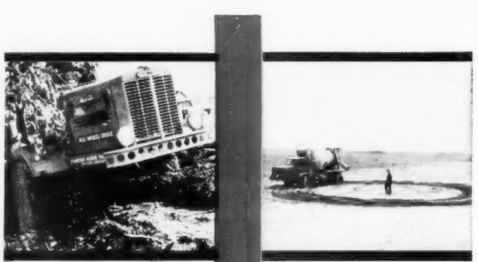
Rock made up to three cycles going through the plant. Gustafson used a 1-inch screen on the bottom deck, and split the upper deck, using 1½ feet of 2-inch mesh and 4 feet of 2½-inch mesh. Material already meeting size requirements dropped through both screen decks to be routed over the stacker conveyor for stor-

18,000 pound payload on each axle of 4-wheel drive

OSHKOSH 50 50

INCREASES PROFITS for National Ready-Mixed Concrete Co. Lancaster, California

Coast to coast ready-mixed concrete companies — like National of Lancaster, Cal. — find the Oshkosh 50-50 is a real profit maker! Here's 4-wheel drive traction to go where other concrete carriers can't go — to get jobs competition can't handle. With an Oshkosh 50-50, you get an 18,000 pound payload on each axle . . . easy maneuverability . . . quick load spotting . . . automatic locking center differential in transfer case . . . and other exclusive features. Ask for free demonstration. You'll be glad you did!



4-wheel drive provides sure-footed traction — makes tough going easy for Oshkosh.

Oshkosh's shorter wheel base means a smaller turning circle — greater maneuverability!

Have you seen Oshkosh's new "50-50" brochure? Write for your free copy today!

OSHKOSH

4 and 6 WHEEL DRIVE TRUCKS

OSHKOSH MOTOR TRUCK, INC.
OSHKOSH, WISCONSIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 285

outpeeps paving crew on the move

A second 2½-inch course is laid in a 10-foot lane by a Barber-Greene finisher for the new 40-foot pavement. The finisher works on one lane for a day's run, then lays an adjacent lane the following day.

age. The 2½-inch mesh on the upper screen deck retained all large rock that had to be passed through the jaw crusher. Rock particles retained on the lower screen deck passed through the roll-crusher unit. Return closed-circuit routing enabled the jaw crusher throughs to return for roll-crusher reduction. Then throughs from the roll crusher returned to the screen deck, so that any oversize material could again be routed back for crushing until it met specification tolerances.

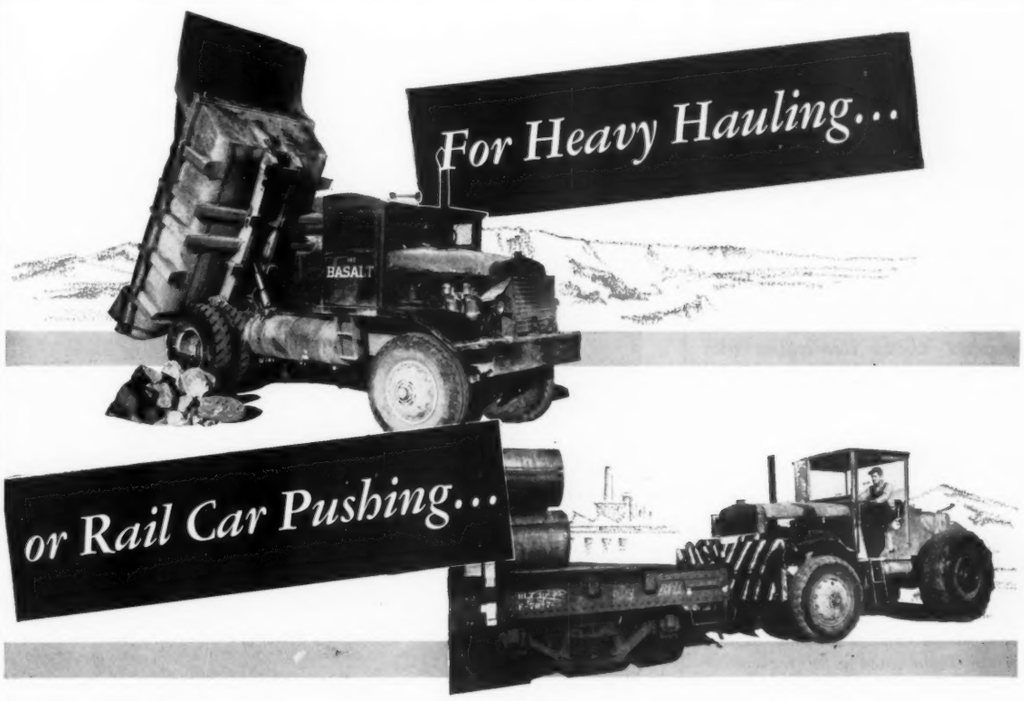
Quick thinking on the part of plant foreman Nick Blackwell got an accidental fire in Gustafson's hot plant under control in a matter of minutes while this job was in progress.

The fire originated when aggregate got too hot, exceeding the flash point of the asphalt. As soon as it broke out, Blackwell cut the emergency valve on the asphalt line, stopping the material from flowing into the mixer. At the same time, he kept the pugmill paddles going. The dry aggregate, under heavy mixing from the pugmill paddles, smothered the fire effectively by absorbing the bitumen in a few seconds. The flames were out before a fire extinguisher, set up nearby, could be brought into use.

A conveyor brought the crushed rock from the plant to a single large surge pile, and it was brought from here to the hot plant by a Caterpillar D8 and dozer. Material used for the aggregate base course was loaded to trucks by a 40-ton surge bin set under the delivery conveyor. The excess fraction between ⅜ inch and No. 4 was rejected by the screening system of the Pioneer hot plant.

High plant mix output

The 185 tons of material turned out hourly by the Pioneer 101 Continuflo asphalt plant was due in some part to processing methods used by



Fuller Transmissions handle the hard jobs easily for Basalt Rock!

Twenty Euclid dumps and two tractors converted into "car pushers" . . . *ALL* Fuller Transmission equipped . . . handle tons of the heaviest work around Basalt Rock Company, Napa, California.

Twelve rear dumps and the two pushers are equipped with Fuller 5-A-920 5-speed Transmissions, and the eight Model 9FDT bottom dumps with Fuller 4-B-86 4-speed Transmissions.

In both these applications Fuller Transmissions deliver the horsepower faster. Right gear ratios, short, easier shifts, result in faster work cycles. Heavy rock and gravel hauls for the dumps . . . industrial locomotive loads for the "pushers"—these are the daily jobs that Fuller Transmission equipped units are doing efficiently at the main Napa plant, the Heraldsburg gravel plant, and in the McNear Stone Quarry on San Pablo Bay.

The company started building this fleet of Euclids with Fuller Transmissions in 1938 . . . made additions in 1944, '45 and '46.

ALL ARE GIVING EXCELLENT SERVICE IN 1956—DELIVERING MORE WORK TIME WITH MINIMUM DOWN TIME!

Select *YOUR* transmissions from Fuller's 110 models—both semi-automatic and full manual control. You'll find the transmission designed to do *YOUR* job . . . better . . . at less cost.

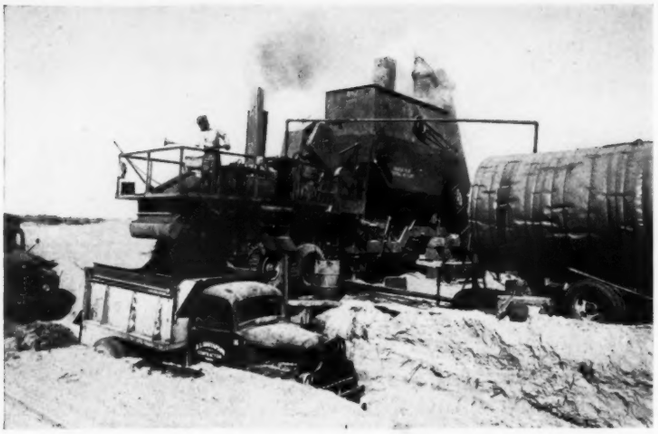
where horsepower really goes to work

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 286



A truck picks up a load of hot-mix at the Pioneer 101 Continuflo plant. The material is transferred through a 40-ton surge hopper, which made it possible for the plant to operate continuously even if trucks were delayed.

(*Continued from preceding page*)

the contractor to permit the plant to run steadily. The contractor left wet aggregate from the rock plant in storage for a week or more so that much of the moisture was either evaporated or drained away by the time the material was needed. He also used a 40-ton surge hopper—the same one used in loading trucks with aggregate for the base course—to transfer the hot-mix to the batch trucks. There was no loss of heat or segregation in the mix as it was dumped. As the cone-shaped steel hopper held about three truckloads, the plant was able to operate continuously, even though haul trucks were temporarily delayed.

Gustafson's hot plant consisted of a Pioneer 101 central mixing plant and a Pioneer No. 580 drier and dust collection unit. The principal components were driven by either diesel engine or electric motor. The pugmill was driven by a General Motors 6-71 diesel, and a General Motors 6-110 engine rated at 300 horsepower drove a 100-kw E-M generator which, in turn, powered various motors on other parts of the plant. An Onan generating plant provided power for night illumination, and a Childers C-100 circulating oil heater kept the asphalt at application temperature.

This high-output plant, exremely portable, had automatic signal lights that warned of diminishing levels of material in a bin, and a hookup for asphalt and aggregate feeds that kept material in correct proportion in a mix.

An SC-6 asphalt, supplied by Arizona Refining Co., Inc., Phoenix, went into the plant at a temperature of 280 degrees. Asphalt unloaded by Viking pump driven by a Ford V-8 engine was stored in a single 12,000-gallon horizontal steel tank that was insulated with glass wool so that heat loss was held down to 3 degrees per hour when the Childers heater was turned off. Flexible swing connections for asphalt and circulating oil lines helped cut down the time needed to set the plant up after a move. On this job, both the asphalt plant and the rock plant worked from two set-ups. The first was about a mile inside the north end of the job, the second involved a 5-mile dead haul to the south end. Both moves were made quickly and efficiently, and the asphalt plant was in operation shortly after its site was changed.

The large-size Ray burner on the plant drier handled its big job well, according to plant foreman C. L. Blackwell. Using PS-300 fuel oil from a 5,000-gallon storage tank, the drier turned out 1,350 tons of plant mix per 1,300 gallons of fuel, when the aggregate being used contained 4½ per cent moisture.

Excess material in the ⅜-inch to No. 4 range was removed, when necessary, by a Trackson front-end loader and wasted. This made it possible to get rid of the material without installing auxiliary screen decks at the rock plant.

Laydown of the material has been conventional, a Barber-Greene finisher paving the 2½-inch-thick roadway in four 10-foot lanes. The paver makes a day's run on one lane, then moves back to begin the next day's run. Compaction is being handled by a Buffalo-Springfield 2-axle tandem steel-wheel roller.

No sealcoat will be applied to the surface, since the project runs through semi-arid country. The prime coat over the aggregate base is an RC-2 application which is standing up well under traffic.

Personnel

William E. Willey, Arizona's state highway engineer, was in general charge of the project. C. B. Browning, his deputy state highway engineer, and J. B. Robinson, district en-

Reserve production capacity gains

40 EXTRA BATCHES A DAY

Koehring 34-E *twinbatch*® paver

hits a top output of 86.7 batches an hour, on 60-second mixing cycle. It maintains high average batching speed because — with *twinbatch* Autocycle mixing — there's plenty of reserve production capacity when you need it to offset normal job delays. This lets you pick up lost time which cannot be made up with limited-production single-drum pavers. For example:

A single-drum paver theoretically mixes up to 50 batches an hour, but usually averages only about 45 batches due to normal production delays. Under identical job conditions — and with the same set-up of auxiliary equipment — Koehring 34-E *twinbatch* easily averages 50 batches an hour, 8 hours a day. You gain 5 extra batches an hour

gineer, assisted in supervising construction. In addition to having Gustafson himself on the job, the B. L. Gustafson firm had Harvey Harden supervising rock production and asphalt laydown, and C. L. Blackwell in charge of the Pioneer hot plant. THE END

Massey-Harris-Ferguson elects sales manager

The former general service manager of the Ferguson Division, B. R. Bermann, has been elected sales manager of the new industrial division of Massey-Harris-Ferguson, Inc., Racine, Wis. The division will market a full line of light and medium-duty industrial wheel tractors and allied equipment.

Portable asphalt plants

■ A self-erecting, strict-gradation-control portable asphalt plant, the Model TM, is presented in a bulletin from Standard Steel Corp. A diagram of the complete unit and detail photographs illustrate the self-lift erecting device, gradation control, positive weight control, steel mixer, welded steel framework, multicompartment storage bin, cold and hot elevators, and chassis and running gear. Details are given on accessories—steam-atomizing boiler, asphalt-storage tanks, and cyclone dust collector.

To obtain Bulletin 541 write to Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 50.

The Model 360 Hopto Digger now has a ground reach of 26 feet.

Redesigned digging unit has added power, reach

■ New design and engineering features for the Model 360 full-swing Hopto Digger have been announced by the Badger Machine Co.

According to the manufacturer, relocation of the two 5-inch hoist cylinders has given added power to the 360, as well as improved the over-all appearance of this completely hydraulic ½-yard machine. A redesigned, streamlined cab is said to assure the operator better visibility for every digging and hoisting operation.

The ground reach of the 360 has been extended to 26 feet; the digging depth remains at 17 feet. Both ⅜ and ½-yard-capacity backhoe and shovel buckets are available, as well as a greater variety of power units.

For further information write to the Badger Machine Co., 1122 W. 5th St., Winona, Minn., or use the Request Card at page 18. Circle No. 87.

Ready-mix concrete

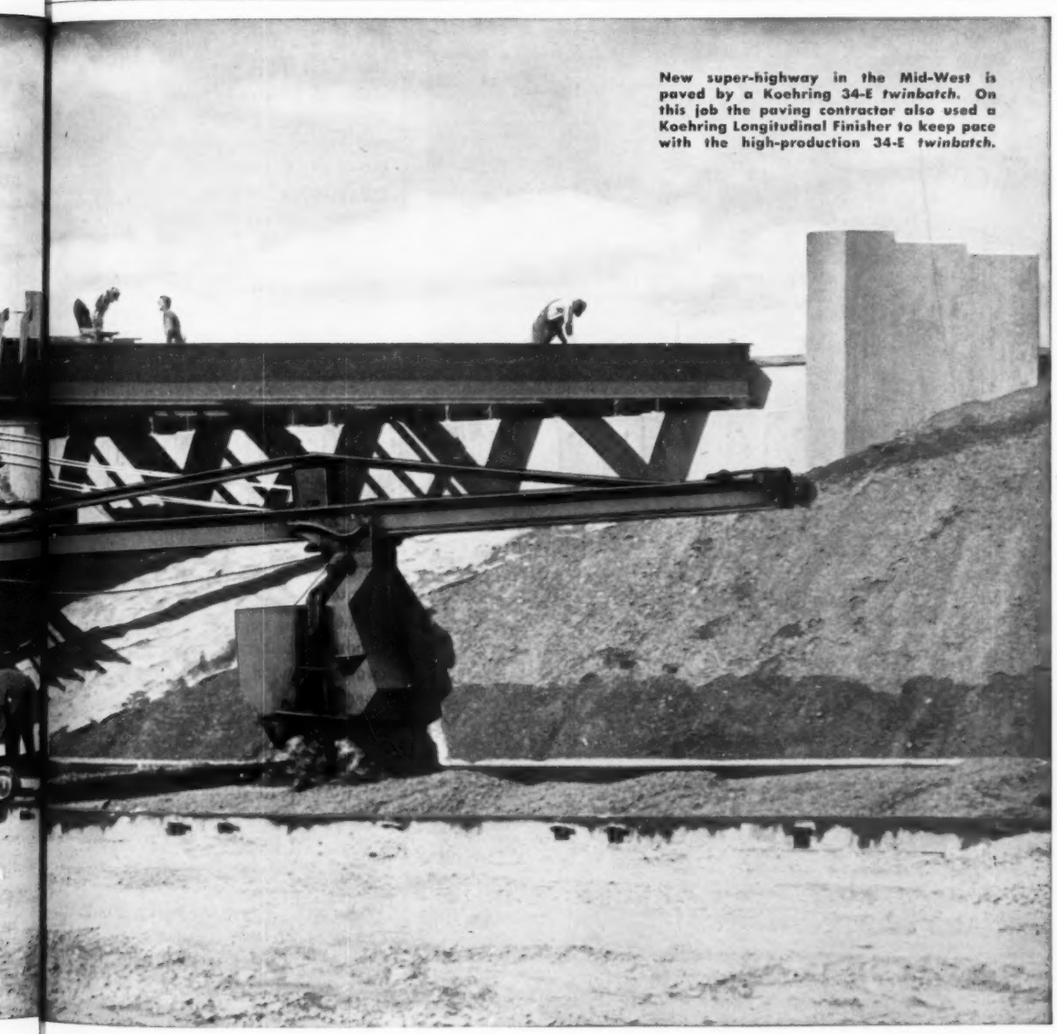
■ The Willard Concrete Machinery Sales Co.'s method of preparing ready-mix concrete is described, together with concrete-handling machinery, in literature from the firm. Every step of the method, from weighing out of the aggregates to the placing of the concrete, is shown in flow charts. Sack and bulk setups turn out 210 cubic yards in an 8-hour day, according to the company. Other literature shows the firm's truck mixers, batchers and conveyors, and loaders. Complete specifications are given on each unit.

To obtain this literature write to Willard Concrete Machinery Sales Co., 11700 Wright Road, Lynwood, Calif., or use the Request Card at page 18. Circle No. 39.

Onan names sales engineer

D. W. Onan & Sons Inc., Minneapolis, Minn., has appointed Kennth Hamilton to the postion of sales engineer. In his new capacity, Mr. Hamilton will contact manufacturers and users of engines in New York, western Pennsylvania, western Ohio, and areas as far west as Detroit.

He will maintain offices in Buffalo, N. Y.



New super-highway in the Mid-West is paved by a Koehring 34-E *twinbatch*. On this job the paving contractor also used a Koehring Longitudinal Finisher to keep pace with the high-production 34-E *twinbatch*.

over the single-drum paver — 40 extra batches a day. Yet, it requires only about 3 extra batches a day to offset the slight additional cost of a 34-E *twinbatch* paver. That leaves a net gain of 37 extra batches per day to help maintain schedules, complete more jobs per season, and earn more profits per job.

No expense for extra equipment

You get this extra paver production with no additional investment in auxiliary equipment. By maintaining 50 batches an hour, the Koehring 34-E *twinbatch* keeps your present batch plant, hauling and finishing equipment working at maximum efficiency. What's more, this increase over single-drum paver production requires no extra paver operating expense, service or maintenance. The 34-E *twinbatch* is as simple as a single-drum machine. Basic units are the same, except for the double compartment drum — and, the Koehring 34-E is easier to operate because, with *twinbatch* Autocycle control, every mixing operation is automatic, accurate and fast.

You'll be miles ahead on your highway, airport and other big-production paving contracts with a Koehring 34-E *twinbatch* paver. Better see your Koehring distributor about it today, or write for bulletin. Also look into the mobile, rubber-tired 16-E *twinbatch* for smaller jobs.

KOEHRING COMPANY

Subsidiaries: JOHNSON PARSONS • KWIK-MIX

Milwaukee 16, Wisconsin

For more facts, use Reader-Reply Card opposite page 18 and circle No. 287

New giant ditcher, power steered, excavates 600 cubic yards per hour

The new Gar Wood-Buckeye 330, which dwarfs a 1956 automobile parked alongside, can excavate enough dirt in 8 hours to fill a fleet of 480 large dump trucks.

■ Field trials on what is described as the world's largest ditching machine have been successfully completed, according to an announcement by Gar Wood Industries, Inc. Known as the Gar Wood-Buckeye 330, the giant machine excavates 600 cubic yards of dirt per hour, cutting a trench 11 feet 3 inches deep and 5 feet 4 inches wide.

According to the manufacturer, the 330 was designed to meet the need for a heavy-duty pipeline ditcher that could also be adapted for deep sewer work. In the past, trenching for large pipeline construction had usually been handled by ¾-yard backhoes.

Gar Wood-Buckeye engineers point out, however, that a backhoe is productive only 37 per cent of its operating time, due to the swing and dumping cycle, excavating an average of 75 cubic yards per hour. The new Gar Wood-Buckeye 330, on the other hand, is productive continuously, they report. Matching the 600-cubic-yards-per-hour digging capacity of the new machine with that of a ¾-yard backhoe, the 330 proves eight times more efficient.

Besides pipeline and deep sewer work, the versatile Gar Wood-Buckeye 300 can be adapted for open-ditch-type irrigation work, digging a trapezoidal ditch with a top width of 19 feet, a depth of 8 feet, and a bottom width of 3½ feet.

One of the largest pieces of mobile construction equipment ever built—and yet one-man operated—the 330 incorporates many design features never before used in ditching machines. A hydraulic power steering arrangement provides the operator with fingertip steering control for the 110,000-pound machine. The 330 forges ahead on a combination of 30-inch tracks in the rear and 30-inch pneumatic tires in front.

Power from a Caterpillar diesel rated at 220 operating horsepower flows through a torque converter to a unique arrangement of two Allison torquematic transmissions. A choice of 15 speeds for the digging wheel drive is provided, and shifting can be done at all speeds. The travel mechanism can be stopped while the digging wheel continues to operate and clean out the buckets—a feature said to be particularly valuable whenever adverse digging conditions are encountered.

The 330's 17-foot 6-inch-diameter digging wheel is lowered or raised by two individual hydraulic hoist units. Each has separate controls to allow independent or simultaneous operation. Either the front or rear of the digging wheel can be raised or lowered.

The dirt conveyor is hydraulically driven at variable speeds. The conveyor operates independently of any other function. Another independent hydraulic unit controls the elevation of the conveyor.

For further information write to Gar Wood Industries, Inc., 36253 Michigan Ave., Wayne, Mich., or use the Request Card at page 18. Circle No. 108.

Field joints with Beth-Cu-Loy only a matter of minutes

Bolts, a band of Beth-Cu-Loy, and a hand wrench are all you need to make a tight culvert joint right in the field.

Compare this with the man-hours needed to assemble an equivalent culvert of any other material!

Ease of assembly is only one of many reasons for the growing use of drainage pipe made of Beth-Cu-Loy galvanized sheet. The strength of steel permits the use of relatively light-weight material, so that handling is simpler and costs less. Long lengths are feasible, too, reducing the number of joints and speeding up installation of the pipeline.

Trenching can be less finicky because Beth-Cu-Loy pipe is flexible regardless of diameter, easily conforms to grade and alignment. Further, it flexes with the fill to equalize loads around it, and absorbs vibration, impact and shifting actions due to weather.

The copper in Beth-Cu-Loy sheets, along with the heavy zinc coating, provides a double defense against corrosion. Pipe and culvert fabricated from this steel give long and trouble-free service. Bethlehem manufactures the Beth-Cu-Loy galvanized corrugated and flat sheet stock used by pipe fabricators. If you would like to have more information about Beth-Cu-Loy or the names of those who can supply pipe made from it, just call our nearest sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 288

Owatonna starts work on new hydraulics plant

The Owatonna Tool Co., Owatonna, Minn., has started construction of a new single-story plant to house manufacturing and office facilities of the firm's new hydraulics division. Long-range plans call for a facility that will eventually house all of Owatonna's manufacturing operations. The new building will be ready early next year.

The 1956 line of FWD trucks features this cab-over-engine design.

Four-wheel-drive units to 40,000 pounds gvw

■ Its 1956 line of cab-over-engine trucks—12 models featuring four-wheel drive and ranging from 14,500 to 40,000 pounds gvw—has been announced by the Four Wheel Drive Auto Co. The new trucks are designed for highway maintenance and construction, heavy construction hauling, and other uses.

The new cab-over-engine styles are available in all 4×4 weight classifications and also may be obtained for special six-wheel-drive applications. They range in engine horsepower from 131 to 240, and vary in transmission speeds from 4 to 10.

Standard center differential on all models is FWD's 50-50 power divider. A 1 to 2 power divider proportioning torque one-third to front wheels and two-thirds to rear for trucks designed to meet special load requirements, is optional equipment in all but the smallest model. Standard engines for all models from 14,500 gvw to 36,000 gvw are the BD and RD gas-powered series. Two 40,000-gvw models have GK-series engines.

The new cab-over-engine design of the 1956 FWD line features an all-steel cab with 92-inch outside width to assure maximum driver comfort. The cab has a wide visibility windshield, as well as extensive side and rear glassed areas.

The Model 140, smallest of the line at 14,500-gvw rating, has a 142-inch wheelbase. All other models have 154-inch wheelbases.

All of the 12 cab-over-engine trucks feature FWD's exclusive axle design and have tapered-front, heat-treated alloy-steel channel frames to provide greater strength with less chassis weight. Frame and axle construction is carefully engineered to the load requirements of each model.

For further information write to the Four Wheel Drive Auto Co., Clintonville, Wis., or use the Request Card at page 18. Circle No. 57.

Goodyear appoints three

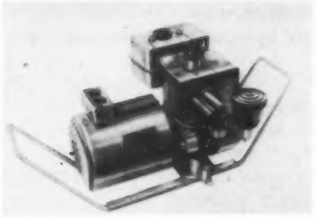
The new eastern sales manager of the Goodyear Tire & Rubber Co., Akron, Ohio is J. W. Smith. Formerly manager of the company's Chicago, Ill., district, Smith succeeds O. A. Schilling.

The manager of Goodyear's industrial products division in Cleveland, Ohio, J. L. Sinclair, has been made Chicago district manager. He will be replaced at Cleveland by R. J. Arlo.

Portable electric plant for on-the-job power

■ A new lightweight (88 pounds) engine-driven electric plant, rated at 1,000 watts continuous duty, is available from the International Fermont Machinery Co., Inc., Ramapo, N. Y. This small portable electric utility is designed for use in light construction activities.

The 1,000-watt plant comes as a completely operable basic unit with separately available special accessories. The basic unit is a manual-starting, 2-wire, 60-cycle, single-phase ac set. Its Briggs & Stratton engine is equipped with air filter, fuel system and tank, ignition system, lubrication system, governor, and muffler. The entire unit is permanently



aligned and mounted on a steel base and carrying handle combination.

Special accessories include a residential silencer, 3-foot flexible hose, two-wheel dolly with handle, 2-wire 50-cycle operation, and canvas cover.

For further information write to International Fermont Machinery Co., Inc., Ramapo, N. Y., or use the Request Card that is bound in at page 18. Circle No. 118.

Maintains uniform rolling speed automatically; steers and rolls easier on TIMKEN® bearings

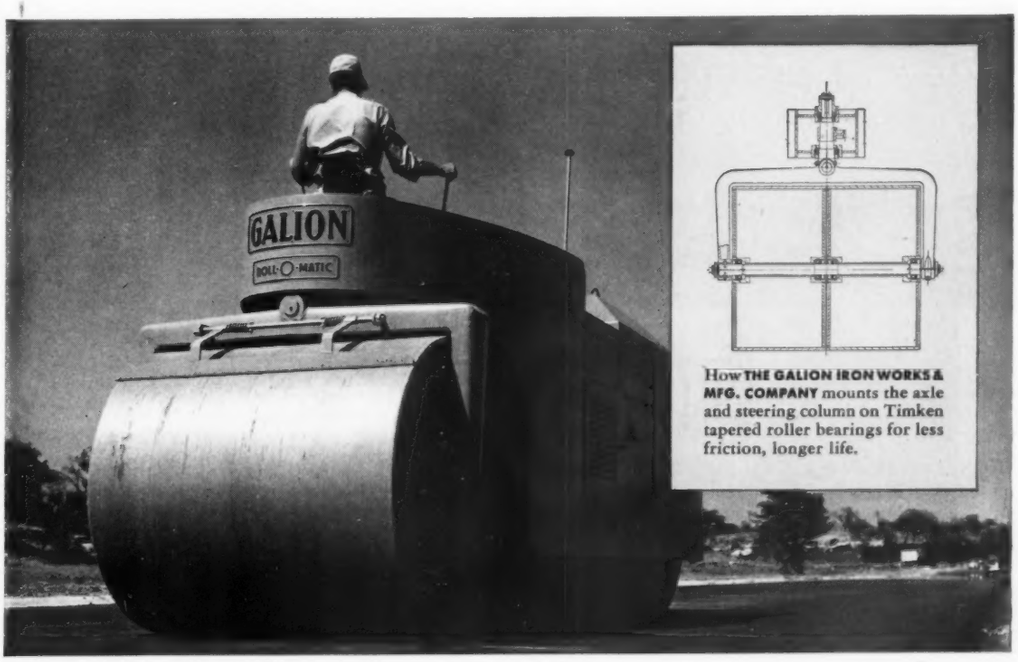
THE Galion Iron Works & Mfg. Company's ROLL-O-MATIC (torque converter) drive automatically applies the driving force as the work demands—and automatically maintains desired roller speed regardless of grade or working conditions. There's no throttle to adjust, no gears to shift. To make sure the new tandem rollers steer and roll *easily*, Galion engineers use Timken® tapered roller bearings on compression roll, steering roll assembly, and final drive.

Because Timken bearings practically eliminate friction, they make it easier to start rollers moving and keep them moving. Timken bearings cut friction because they're designed to roll true; and because they're made with microscopic accuracy to conform to their design.

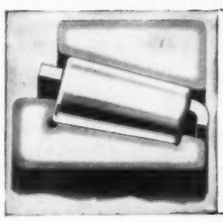
Steering is easier, too, because the entire weight of the front end of the machine is supported by two Timken bearings on which the compression roll revolves. The tapered construction of Timken bearings lets them take these tremendous thrust loads as well as radial loads and combinations of the two. And full line contact gives Timken bearings the extra load-carrying capacity they need to take heavy loads.

Whether you buy or build machinery, make sure the bearings are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **THE GALION IRON WORKS & MFG. COMPANY** mounts the axle and steering column on Timken tapered roller bearings for less friction, longer life.



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface over a tough, shock-resisting core. Result: longer bearing life.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◐ AND THRUST →◐← LOADS OR ANY COMBINATION →◐←

For more facts, use Reader-Reply Card opposite page 18 and circle No. 289

Microphone, speaker-mike for two-way radio use

■ Motorola has announced a transistorized dynamic microphone for use in mobile radio applications. The new accessory reportedly provides unprecedented mobile transmission quality comparable to that of a base station.

This new microphone features a rugged specially-designed dynamic element employed in conjunction with a built-in transistor preamplifier. Unexcelled voice intelligibility from the mobile unit is said to be the result of this feature.

The transistor preamplifier, an integral part of the microphone, boosts the dynamic output to conventional transmitter input level, eliminating the need for preamplification at the transmitter. This technique is said to overcome the noise pickup problem inherent in mobile installations.

Motorola's newest addition to its line of two-way mobile radio equipment is this dynamic microphone which doubles as a speaker.

The amplifier draws its power from the conventional "talking current" supply. Offered as a replacement item or an optional accessory with Motorola equipment, the all-metal palm-size device is directly interchangeable with Motorola carbon microphones now in use.

The new development is also available as a dual purpose dynamic speaker-mike which functions as a full - output communications - type loudspeaker as well as a dynamic microphone. It can be conveniently mounted or held near the operator's ear to overcome high ambient noise.

The dynamic speaker-microphone is the same size as the dynamic microphone and is also offered as an optional accessory with Motorola equipment. A minor modification adapts earlier Motorola equipment to use the unit.

For further information write to Motorola Communications & Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 127.

SEE THE Forty Five BEFORE YOU BUY

Here's motor grader design that pays off in extra output on today's tougher, more precise jobs. You get these big advantages when you put the FORTY FIVE to work for you—more power at the wheels, more dirt at the blade, plus precision control and ease of operation.

Allis-Chalmers diesel engine with follow-through combustion provides real lugging ability . . . responds quickly to varying load conditions . . . has the power with tandem drive to pull through soft spots, roll big windrows, peel off that last inch of tough, hard dirt.

ROLL-AWAY moldboard reduces friction drag by rolling the load up and ahead of the blade edge . . . moves more dirt with less effort . . . makes more efficient use of engine power on sloping, rough grading, stripping and other heavy-duty construction and maintenance jobs.

Toggle-type controls give the operator finger-tip command of every blade position, every job. Exclusive mechanical toggle-type action provides a positive "feel," yet operation of moldboard components, scarifier and front wheel lean is accurate and easy.

Get a demonstration of the FORTY FIVE from your Allis-Chalmers dealer . . . let him show you how fully-enclosed power steering, accelerator-decelerator pedal, "box seat" comfort and visibility, and other features give you an extra measure of performance on all your grading jobs. Check the complete service program he offers you . . . factory-trained servicemen and True Original Parts for high-quality service, continued top performance and long equipment life.

Forty Five
120 brake hp
23,800 lb
6 forward speeds to 20.6 mph
3 reverse speeds to 7.0 mph

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

ROLL-AWAY is an ALLIS-CHALMERS trademark

For more facts, use Reader-Reply Card opposite page 18 and circle No. 290

New coating material saves forms and labor

■ A form coating that increases the life of wood or plywood concrete forms and produces clean, smooth concrete surfaces by preventing concrete, mud, and water from adhering is announced by Form Kote, Inc., Milwaukee, Wis. The new product, called Form Kote, is applied by roller, brush, or spray.

According to the manufacturer, Form Kote penetrates the wood and produces a protective coating that is unaffected by mars, scratches, or other abrasions that occur in handling the forms. The scouring effect of wet concrete does not remove it.

One of the advantages of Form Kote is that it eliminates the scraping and coating of the forms between each pour, according to the manufacturer. It reduces the frequency of applications and will not raise the grain of wood. The first coat retards weather-checking even when applied on old forms. The coating does not leave a deposit on the concrete or discolor it.

One application of Form Kote is effective for an average of four pours, the company reports. The forms may be used immediately after application. No drying or curing is necessary.

For further information write to Form Kote, Inc., 700 W. Virginia St., Milwaukee 4, Wis., or use the Request Card at page 18. Circle No. 117.

Mixer, crane carriers

The offset cab, 15,000-pound front axle, rubber-mounted and rubber-bushed bogie assembly, and Eaton tandem axle of the Mixer-Master carrier chassis are pictured and described in a bulletin from the Crane Carrier Corp. Two crane carriers for 12½ and 15 to 17½-ton truck cranes are also featured in literature from the firm. Both crane carrier models have International Harvester engines. Complete specifications of the Mixer-Master and the crane carriers are given.

To obtain this literature write to Crane Carrier Corp., P. O. Box 5008, Tulsa, Okla., or use the Request Card that is bound in at page 18. Circle No. 112.

New heavy-duty crane has 75-ton rating

■ Production is under way on the Marion Power Shovel Co.'s new 87-M, a low-slung crawler-mounted unit designed and built specifically for heavy-duty crane work. The new machine is basically rated at 75 tons at a 12-foot radius with 50-foot boom.

Major design features of the new machine include extra-wide-spread crawlers; alloy-steel lower frame, axles, and crawler frames; double-hook rollers; and a third drum that can be used for either auxiliary work or as a high-speed boom hoist. A special heavy-duty boom, with open-throat point section, will handle the maximum rated capacity of the machine. Deep center sections with tapered extensions are available for long boom work.

The 87-M's third drum is mounted on the head shaft of the low gantry and driven by the crowd retract clutch through an intermediate shaft and chain drive. A spring-set air-released brake and a rachet and pawl are incorporated in the unit. As an added feature, the third drum can also be equipped with a reversing clutch to obtain power up, power down control for boom hoisting.

Other typical ratings of the crane are: 63 tons at 18-foot radius with a 70-foot boom; 30 tons at 30-foot radius with a 70-foot boom; 17 tons at 45-foot radius with a 100-foot boom; 10½ tons at 60-foot radius with a 140-foot boom. For specific work requirements, the boom can be fitted with either a 15-foot or 30-foot primary jib.

Job applications of 87-M, as recommended by the manufacturer after extensive field tests, include pile driving, heavy materials handling, steel setting, concrete pouring, and other heavy-duty crane operations where capacity, power speed, and stability are important.

For further information write to Marion Power Shovel Co., Cheney Ave., Marion, Ohio, or use the Request Card at page 18. Circle No. 109.

The Marion 87-M, a low-slung crane for heavy-duty lifting or other material-handling work.

Tendons for concrete

■ Stress-relieved steel tendons for prestressed concrete are detailed in a catalog from Union Wire Rope Corp. A table lists nominal diameters —of from ¼ to ½ inches, and ultimate strengths of from 9,000 to 36,000 pounds. The yield strength of Tufwire is measured by the 0.2 per cent offset method. The average modulus of elasticity is approximately 27,000,000 psi. Job photos show how pre-tensioned, prestressed concrete may be used on bridges, buildings, floor slabs, beams, piles, pipelines, and bypasses.

To obtain this catalog write to Union Wire Rope Corp., 2100 Manchester Ave., Kansas City 26, Mo., or use the Request Card at page 18. Circle No. 13.

Rock ripper

■ The Ateco rock ripper for mounting on the International TD-24 is described in a bulletin from the manufacturer, Greenville Steel Car Co. Fully tractor-mounted and hydraulically powered, the unit rips to a depth of 24 inches. Other features of the ripper are curved and tapered shanks, swivel-mounted standards, and depth and pitch adjustment.

To obtain this bulletin write to Greenville Steel Car Co., Greenville, Pa., or use the Request Card at page 18. Circle No. 43.

Manu-Mine Research names executive vice president

Manu-Mine Research & Development Co., Reading, Pa., has appointed Clayton A. Landsidle executive vice president of the firm. General manager of the company since 1954, Mr. Landsidle has served in many research organizations.

NEW 360 HALF-YARD HOPTO

DIGGER • SHOVEL • CRANE

Here's the completely hydraulic *mobile* shovel that equips you to do more jobs with lower equipment investment . . . *at greater profit!*

The 360 HOPTO swings three hundred and sixty degrees from its over-the-cab travel position. Operator's cab swings with unit for face-forward, *safe* operation. Feather-touch controls actuate every movement from positioning of outriggers to fast-cycling swing and 180° tilt of bucket! Heavy-duty hydraulic system with built-in relief valves gives an easily managed, oil-cushioned, 20 ton force to dipper stick! ! !

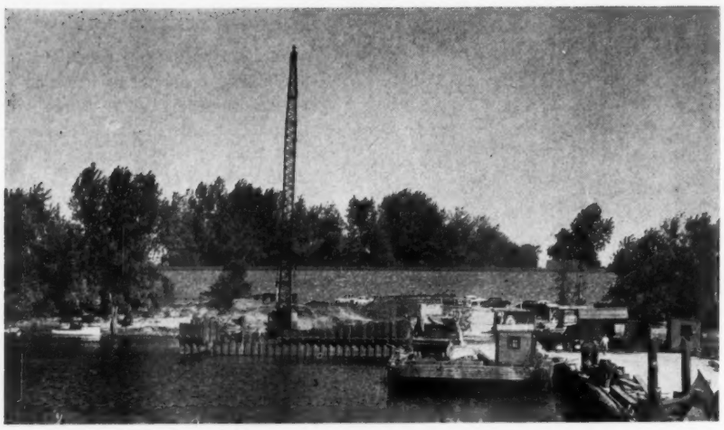
Interchangeable backhoes and shovel buckets have H and L replaceable teeth and are available in three-eighths and one-half yard sizes. Check *NOW* on the many advantages of owning this work-hungry, mobile digger, shovel, crane!

Write today for complete information on the '360' or any one of six quarter-yard HOPTO Models!

BADGER MACHINE CO.

DEPT. E • WINONA, MINNESOTA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 291



A barge-mounted Manitowoc 3000B crane is used to place dewatering pumps in one of the four 23 x 78-foot cofferdams. In the background is the riprap-covered flood dike rising 37 feet above mean high water. *C&E Staff Photos*

Pier job stays on schedu esp

Riverbed hardpan, a hurricane, and high water complicate cofferdam work for bridge substructure

When a contracting firm starts a project, it usually expects to run into some difficulty. And so when Savin Construction Corp., East Hartford, Conn., began building cofferdams for piers carrying the new State Street Bridge across the Connecticut River at Hartford, Conn., and then ran into a strata of hardpan and rock while sheet piling was being driven, the problem was taken in stride. But Savin had hardly counted on the worst hurricane of the century in the area, or high water in the river, to multiply its problems.

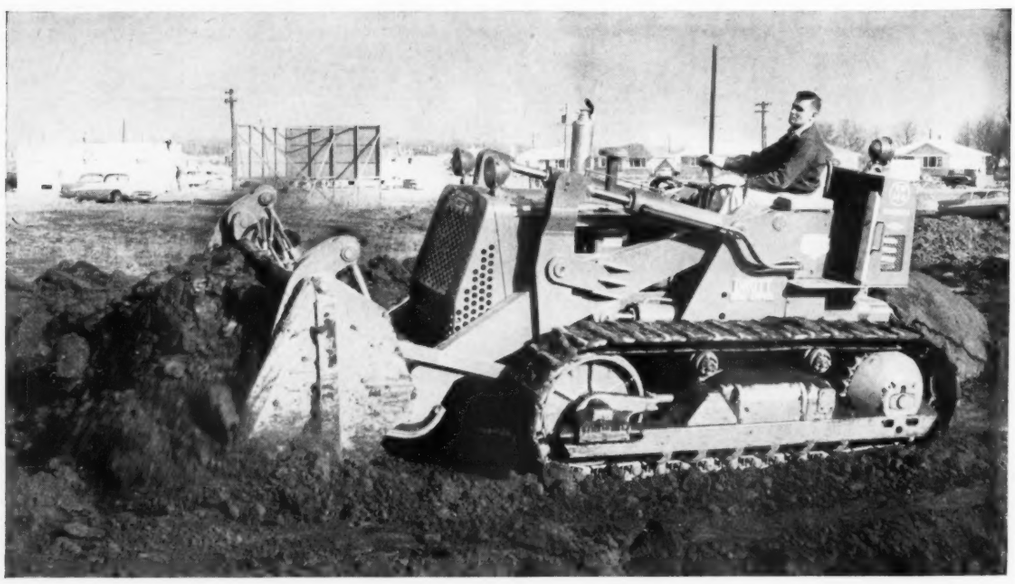
Under a $1,250,000 Connecticut State Highway Department contract, Savin began driving the Z-type sheeting for the cofferdams in which five river piers were to be constructed. Four land piers and two abutments were also included in Savin's job, which has Gordon C. Linberg as superintendent. Four of the cofferdams measure 23 × 78 feet, while the west cofferdam, 23 × 108 feet, was made longer to permit the bridge roadway to separate into two parts at this point, one running north, the other, south.

Hardpan and rock

Using a Vulcan No. 1 hammer on a Lima crane, Savin began the tedious task of driving the sheet piling through approximately 4 to 5 feet of hardpan and rock to a buried rock ledge. Two frames were used for each cofferdam. The lower frames, located about 15 feet below water level, were made up of 30-inch wide-flange steel sections. Top frames were located 17 feet above the steel frames. Excluding that for pier 4, these consisted of steel H-beam sections. The top frame for pier 4 consisted of 14 × 14-inch timber. Both top and bottom frames were tied together with vertical and diagonal cross-bracing, made from steel angles.

Cofferdams flooded

Two of these cofferdams had been placed when Hurricane Diane struck, raising the level of the Connecticut River and flooding both installations. As soon as it was practicable, Savin got a number of pumps on the job, including a Gorman-Rupp 12-inch unit driven by a GM diesel, a Fairbanks-Morse 10-inch electric high-lift, a Moretrench 8-inch gasoline-driven unit, and a Fairbanks-Morse 6-inch electric high-lift. About 30 feet of water was removed from one of the 23 × 78-foot cofferdams in 3½ hours.



It's Skid-Shovel, dozer, clamshell and "carry-type scraper," all in one

...It's the International Drott 4-In-1!

Skid-Shovel position gives you a speedy, straight-forward, depth-controlled bucket-fill. And to get "concrete-smashing" excavating force, just apply exclusive Drott *triple-power, pry-action breakout!* . . . Give the "machine selector" lever a finger-tip flick, for big-capacity dozing under hydraulic control . . . Another flick gives you a gravel-gulping clamshell, with a 30-inch dumping height advantage over ordinary "roll-forward" buckets! . . . Another lever-flick, and Bull-clam action is at your service—to heap-load the bucket like a carry-type scraper; to strip, grade, or spread with amazing accuracy, using clam lip control! And you *select* any Four-In-One machine action *on the go!*

It's the exclusive International Drott Four-In-One that arms you to beat a fleet of limited-duty rigs. Now available in 3 sizes, 1-yard to 2¼-yard capacity—all with the built-in protection of exclusive, shock-swallowing Hydro-Spring! Ask your International Drott Distributor for a Four-In-One *versatility unlimited* demonstration!

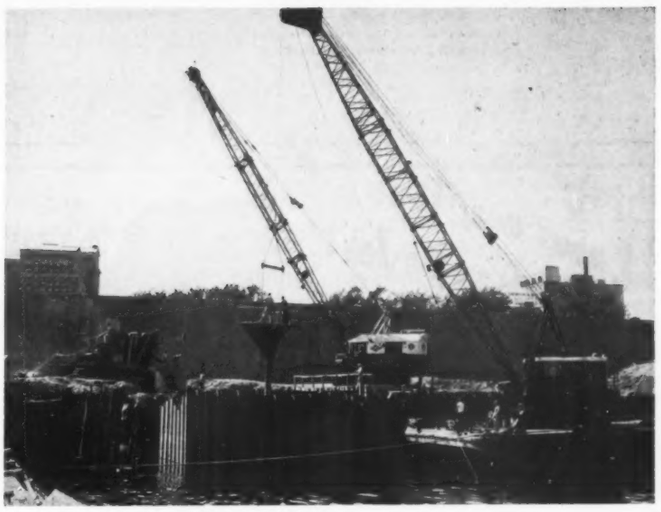
Ditch, grade, "dress shoulders" with Bullangledozer Attachment!

Remove bucket and attach this low-priced Bullangledozer—angle the blade to either side—then tilt the blade from the seat as desired with Drott's exclusive, roll-back action—and you've got a real ditching, sloping, or shoulder-dressing outfit. Or used as a straight dozer, this blade does heavy digging or fine grading under hydraulic "radius control." *Give it a try-out!*

International Harvester Company, Chicago 1, Illinois

INTERNATIONAL® DROTT

...espite nature's hazards



The tremie pipe is held in position by a Koehring barge-mounted 803 crane as a pour is made for the 23 x 108-foot west cofferdam. The Lima 1201, working from a trestle built out from shore, uses a 100-foot boom to swing a 2-yard bucket of concrete from the Ransome paver to the pipe.

Only three pumps were left in the cofferdams once water had been discharged. Two Gorman-Rupp 4-inch electric pumps were left on the bottom frames of both cofferdams to take care of all seepage, and the 8-inch gasoline-driven pump was left inside one of the cofferdams to serve as a standby in case power failure stopped the 4-inch pumps from working.

High water in the river has flooded the cofferdams a few times since, making additional pumping necessary. But high water is not unusual at this point in the river. On the east shore, there is a riprap dike with an elevation 37 feet above mean high water, while on the west shore a concrete flood wall rises 45 feet above the water.

Tremie seal placement

Barges, positioned end-to-end and paralleling the cofferdams for the full width of the river, are facilitating the storage and movement of equipment on this job.

Concrete for the tremie seal in the cofferdams was mixed by a Ransome dual-drum paver located on the west shore. In order to place the 1,565 cubic yards of concrete for the large west cofferdam, Savin constructed a trestle extending from the west shore so that the Lima 1201 crane with 100-foot boom would be able to reach the pour.

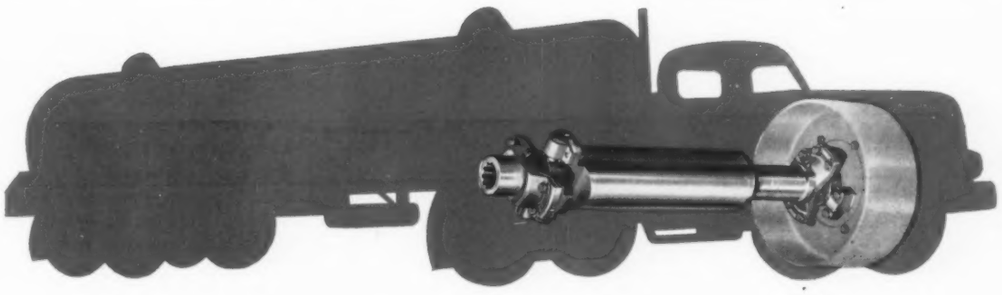
Two bents, each consisting of four 14-inch pipe piles, were driven to support the six 30-inch-deep wide-flange girders which, in turn, support the 10-inch timber decking. When the tremie-seal work was ready to start, the Lima crawled out to a point where it could swing a 2-cubic-yard-concrete bucket from the Ransome paver to the tremie pipe. All during this work, the pipe was held in position by a Koehring barge-mounted 803 crane.

Two concrete buckets were used in placing the seal, so that a minimum of time was lost between pours. As one was being filled at the paver, the full bucket was picked up and swung directly to the pour.

In addition to these five river piers, scheduled for completion this fall, three piers on the Hartford shore and one pier and one abutment on the East Hartford shore will be constructed so that the completed roadway will run over the existing flood wall and dike and tie into existing approaches on either side of the river.

THE END

RUGGED



Manufacturers of the big diesel transports, that must stand up under hour-after-hour of gruelling service, have learned to rely upon MECHANICS Roller Bearing UNIVERSAL JOINTS to deliver hundreds of thousands of miles of trouble-free service. Because MECHANICS JOINTS drive through KEYS—instead of bolts—they stand up under punishment that shears off other types of fasteners. They are designed with less parts and connections for easy assembly and servicing—smooth running balance—maximum strength with less weight—and long, trouble-free, safe operation. Rugged stamina is just one of the advantages you get when you specify MECHANICS Roller Bearing UNIVERSAL JOINTS. Let MECHANICS engineers help you design this and other competitive sales features into your product's transmission train.

MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.
Export Sales: Borg-Warner International
79 E. Adams, Chicago 3, Illinois

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UNIVERSAL JOINTS
For Cars • Trucks • Tractors • Farm Implements • Road Machinery • Aircraft • Tanks • Busses and Industrial Equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 293

A Fordson Major diesel tractor with new ½-cubic-yard loader (foreground) and a Ford industrial tractor with 9-cubic-foot bucket load coarse sand into a dump truck. ►

Announce new line of front-end loaders featuring high lift and dump clearance

■ New front-end loaders for Ford and Fordson Major diesel tractors have been announced by the Tractor & Implement Division of the Ford Motor Co. The attachments feature one-piece box-frame construction and high lift with high dumping clearance.

Operator convenience is another feature of the new loader line. The frame design allows the operator to step on and off the tractor between the upright member and the rear wheel, instead of climbing over rear-attached implements.

The loader for the Ford tractor will fit any NAA, 600, or 800 Series machine, while the attachment for the Fordson Major diesel will fit all FMD tractors. Both models are easily and quickly installed.

The Ford loader, weighing 825 pounds, has a rated load capacity of 1,000 pounds at full lift of 10 feet 6 inches, and a breakaway lift capacity of 2,500 pounds. Rate of lift is 7 seconds at 1,500 rpm. The FMD loader, with a total weight of 1,367 pounds, has a rated load capacity of 1,500 pounds at full lift of 10 feet 7 inches, and a breakaway lift capacity of 5,000 pounds. Rate of lift for this model is 8 seconds at 1,800 rpm.

The FMD loader is equipped with double-acting hydraulic cylinders; the Ford loader may be obtained with either single-acting or double-acting cylinders. Both models have high-capacity vane-type hydraulic pumps and full-circulating hydraulic systems.

The Ford loader takes a 9-cubic-foot material bucket or a 16-cubic-foot light-material bucket. The FMD model takes a ½-cubic-yard material bucket or a ¾-cubic-yard light-material bucket.

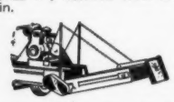
With tractor, the Ford model loader is 14 feet 5 inches long, 5 feet 5 inches high, and has a bucket dump angle at full height of 45 degrees. The FMD loader with tractor measures 15 feet 2 inches long, 5 feet 10½ inches high, and also has a bucket dump angle of 45 degrees.

For further information write to the Tractor & Implement Division, Ford Motor Co., 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 11.

Labor and Time Savings on the Job!

HANDLE MANY JOBS WITH THESE ATTACHMENTS

Strike-off Box Attachment. For road widening fill and asphalt paving. Adjustable on three sides to 6" above grade. Strike-off blade extends 4'. Remove with one pin.



Conveyor Extension Attachment permits backfilling 24" high curb or placing material over 7' from wheels. Take-off drive. Unit is 4' long with independent belt.

Distributors: Write for information on available territories

POWER-PACK BACKFILLER

Performance proved! Everywhere POWER-PACK has been used great savings result in labor and time . . . also you can expect a better fill with no material wasted!

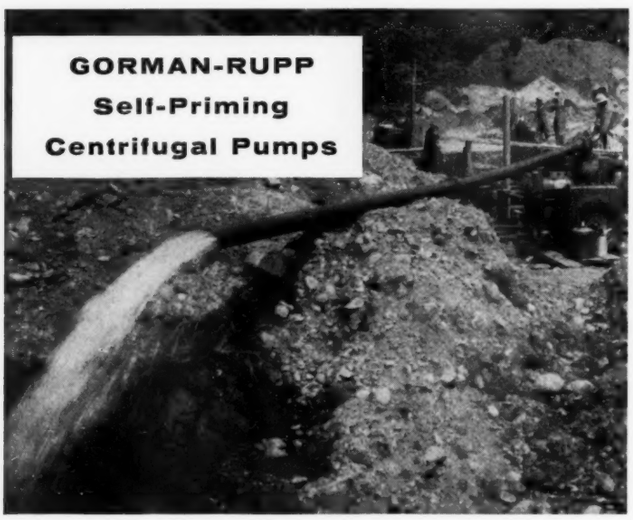
Only one man operating the POWER-PACK can power-backfill curbing, trenches, and pipelines at the rate of *three tons per minute!* This equipment has actually paid for itself on a single job.

Ruggedly built for long service. Easily portable with four swivel wheels and a sure, quick hitch. Can be used with any size dump truck including trailer dumps. Dependable 8.25 Wisconsin engine. Heavy duty belt.

To save time and money investigate POWER-PACK today! Write for booklet or phone your distributor.

POWER-PACK CONVEYOR CO.
13910 Aspinwall Avenue Cleveland 10, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 294



PETER KIEWIT SONS' COMPANY rely on Gorman-Rupp Pumps to handle Charles River seepage on relief sewer project near Boston.

DEWATERING INSURANCE

Work must go on. It *does* with Gorman-Rupp Pumps on the job. They pump out water, dry out excavations fast. In fact, Gorman-Rupp guarantees its pumps to handle more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pumps of similar size.

Engine- and motor-driven pumps available from 1½", 5850 G. P. H. to 10", 240,000 G. P. H. capacities. Ask for bulletin 8-CP-11.

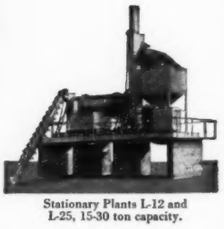
Model 36A-JF, on above project, has an A. G. C. rating of 90,000 G. P. H. at 25' TDH.

Gorman-Rupp PUMPS

THE GORMAN-RUPP COMPANY
305 Bowman St., Mansfield, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 295

White



PORTABLE ASPHALT PLANT

MODEL L-8, 10-15 TON CAPACITY

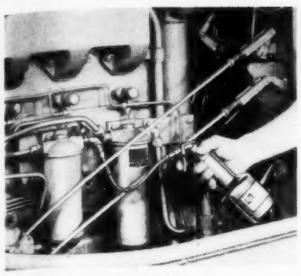
Stationary Plants L-12 and L-25, 15-30 ton capacity.

A *COMPLETE* ASPHALT PLANT ON ONE CHASSIS . . . DRYER, MIXER, HEATING KETTLE. Low in cost, small enough to tow, BIG enough to produce HOT mix, (or any other bituminous mix) for driveways, parking lots, street maintenance, etc. Equipped with 50 HP LeRoi engine, air operated gates for *one* man control, divided compartment, reciprocating feeder for proportioning aggregate. Available as stationary plant with 30 HP electric motor.

Write for catalog and name of nearest dealer.

White MANUFACTURING COMPANY
ELKHART 9, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 296



The Kent-Moore J 5956 primer insures a fuel supply throughout the fuel system before starting.

New fuel system primer eliminates hard starting

■ The Kent-Moore Organization, Inc., has announced production of a new fuel system primer for diesel engines. Known as J 5956, the primer is for use on Detroit Diesel, Buda, and other diesel engines.

Said to be particularly valuable after engine or head overhauls as an engine-starting aid, this new primer insures a fuel supply throughout the fuel system before starting. Use of the primer eliminates danger of damage to fuel injectors, fuel injection pumps, and nozzles caused by attempts to start without an adequate fuel supply throughout the fuel system. It also reduces wear and tear on batteries and starting system, especially during cold weather, according to the manufacturer.

The primer tank holds approximately one quart of fuel and is equipped with a filter. Designed for easy attachment from any position, the J 5956 is simple to disassemble for cleaning of the tank and pump components.

For further information write to the Kent-Moore Organization, Inc., 1501 S. Jackson St., Jackson, Mich., or use the Request Card at page 18. Circle No. 111.

Metal form lubricant for easier stripping

■ Easy stripping of metal forms for concrete pipe and other cast objects, as well as added protection against corrosion of the forms, is said to be afforded by a new compound announced by Alox Corp., Niagara Falls, N. Y. The new product is added to kerosene or light petroleum oils to make an effective release agent.

According to the manufacturer, Alox 436 gives concrete a smooth finish, will not darken or discolor concrete, does not become rancid, and protects steel forms from corrosion or rust—besides preventing sticking of concrete to the forms. Forms need not be cleaned before they are re-used.

Applied either by brush or spray equipment, Alox 436 is available in 5, 15, 30, and 55-gallon containers, as well as in tank car or other bulk shipments. One gallon of the compound makes approximately 20 gallons of form lubricant.

For further information and a trial sample of Alox 436 write to Alox Corp., 3967 Buffalo Ave., Niagara Falls, N. Y., or use the Request Card that is bound in at page 18. Circle No. 5.

Clearing made easier with tool-bar rake

■ A Fleco rake designed for use with Caterpillar D4 tractors equipped with No. 4 tool bar increases the clearing and raking capacity of the machine. This rake, developed by Fleco Corp., is matched to the speed and power of the D4 and can be installed easily on the swinging draft members of the No. 4 tool bar.

The Fleco rake penetrates up to 12 inches of ground, and combs roots, branches and trees from the soil, stacking the debris in dirt-free piles

that can be burned readily. It can also be used for removal of trees within the capacity of the D4.

Stacking trees and brush often takes considerably longer than just bulldozing them out; hence, the Fleco rake performs this task far more efficiently and economically, according to the manufacturer. The rake can be readily interchanged with the D4 tool bar dozer.

For further information write to the Fleco Corp., P. O. Box 2370, Jacksonville, Fla., or use the Request Card at page 18. Circle No. 58.

Schramm sales changes

Schramm, Inc., West Chester, Pa., manufacturer of air compressors, has appointed P. F. Smith, IV, dealer sales manager for the firm.

John P. Powell is now regional sales manager of eastern territories.

dry up and blow away!

PHOTO COURTESY MARLOW PUMPS, RIDGEWOOD, NEW JERSEY

Chrysler-powered pumps de-water 1¾ mile long area for blasting rocks from St. Lawrence Seaway

Blast those rocks! And that's exactly what they're going to do at Ogdensburg, New York. But since the rocks are at the bottom of the St. Lawrence River, the area must first be "dried up" to permit blasting.

It isn't an easy job, but it's a vital one. Rocks *must* be dynamited out of their centuries-old resting places if the St. Lawrence Seaway Project is to proceed as scheduled. Giant cofferdams, extending from offshore islands to the mainland, have been built, and to date more than 400 million gallons of water have been removed from the area.

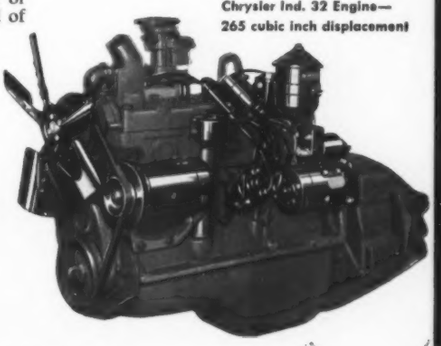
In the performance of this remarkable feat, three Marlow 1061 self-priming centrifugal pumps have been operating around the clock for thirty days, never stopping. The Chrysler Ind. 32 Engine powering each pump is fueled while running. The pumps are delivering about 2500 gallons per minute, running at a speed of 1450 RPM, with a suction lift of twenty feet and a discharge head of twenty-five feet. Engineers working at the site report excellent performance from pumps and power with no trouble whatsoever.

Whether your equipment is to perform on a continuous, intermittent or stand-by basis, you'll want the kind of heavy-duty performance you get from Chrysler *high-speed* industrial engines. From 230 to 331 cubic inch displacement, each Chrysler In-line 6 or V-8 Industrial Engine is engineered, equipped and built for heavy-duty service. Yet each is a *modern* engine, lightweight and small enough to fit practically any construction equipment.

See a Chrysler Industrial Engine Dealer, or write direct to factory. Ask about optional equipment, too.

Dept. 94, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

Chrysler Ind. 32 Engine—
265 cubic inch displacement



HORSEPOWER WITH A PEDIGREE

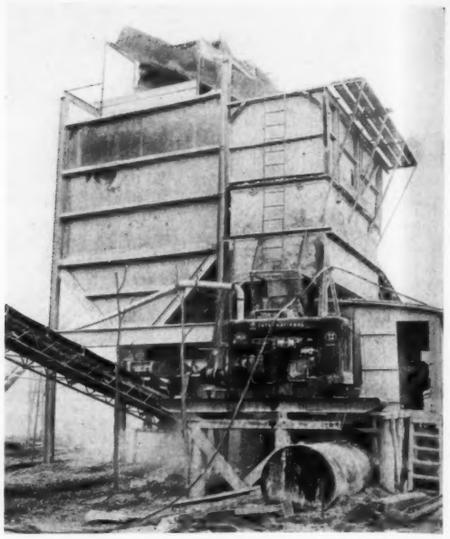
Chrysler

INDUSTRIAL ENGINES

Industrial Engine Division • Chrysler Corporation

For more facts, use Reader-Reply Card opposite page 18 and circle No. 297

Crusher and mixer produce finished rock base for road



Material from the primary crusher goes to the Leco screen atop the 250-ton bin, where 1¾-inch material is retained and bypassed to two Cedarapids 33 x 40 hammermills. These are powered by the two GE 200-hp slip-ring motors in the building.

Rock from the limestone quarry is dumped to the primary crusher by an end-dump Euclid. The Cedarapids feeder moves the rock to a 40 x 53-inch impact breaker, while the Marco conveyor at right carries rock to another crusher. *C&E Staff Photos*

Production of a crushed-rock base material that could be spread and compacted just as it was delivered to the job required an elaborate plant setup, but the extra work involved more than paid off for J. B. Michaels & Co., Inc., Memphis, Tenn., by cutting road work to a minimum. The material did not have to have water or other materials added to it, nor was it necessary to do any mixing or manipulation on the road. The mix was simply dumped, spread, and compacted. And a vibratory roller made it possible for the contractor to secure adequate compaction on a 7-inch lift of loose material.

The 14-inch compacted crushed-rock base course on U. S. 41 just north of Smyrna, Tenn., was given an application of 250 pounds of asphaltic concrete binder per square yard, and 125 pounds of asphaltic concrete wearing course per square yard. War-

"Nae matter hae ye figger tis A BETTER BLOCK."

McKISSICK

Diamond Pattern

WEIGHTED BLOCK

Tops in the field...

All steel construction, cast iron Cheek Weights to insure a free, fast fall.

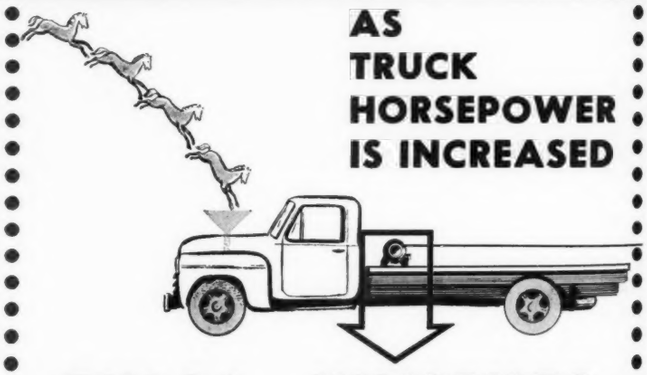
Extra large center pin, Alemite lubrication, flame hardened sheaves, bronze bushings or roller bearings.

Catalog on Request

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

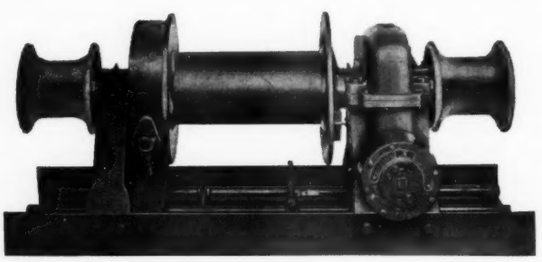
For more facts, use Reader-Reply Card opposite page 18 and circle No. 298



AS TRUCK HORSEPOWER IS INCREASED

TULSA® WINCHES

ARE STRENGTHENED AND IMPROVED TO TAKE ADVANTAGE OF THIS AVAILABLE POWER



Over 28 models to choose from with capacities from 6,000 to 100,000 pounds . . . breaking point is OVER TWICE the rated capacity. See your nearest TULSA WINCH distributor for complete details.

Tulsa Winch
TULSA, OKLAHOMA DIVISION OF VICKERS Inc.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 299

Rock, calcium chloride, and water are mixed in pugmill; watering and manipulation on the road are unnecessary

ren Bros. Road Co., Cambridge, Mass., did the bituminous work to complete the pavement.

The base material delivered to the road in dump trucks consisted of a well graded crushed rock, with a maximum size of 1½ inches, which had an optimum amount of water for compaction and contained 4.75 pounds of calcium chloride per ton of rock. Trucks dumped the material to a Jersey spreader pushed by a Caterpillar D8 tractor. The spreader was adjusted to lay the loose material to a 7-inch thickness for the first two courses. The third course was spread 6 inches thick. The spreader laid out the material more than 12 feet in width, and completed the 26-foot-wide base in two passes.

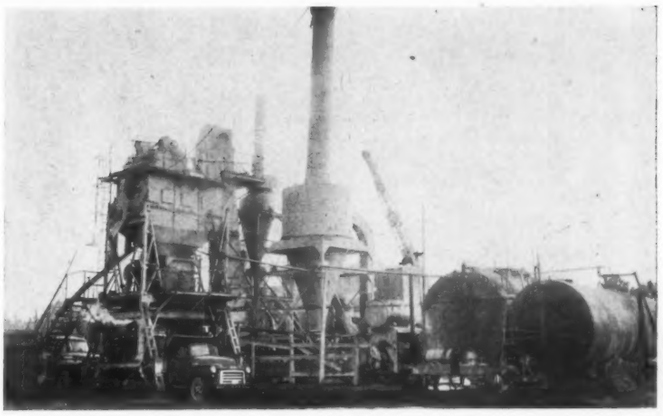
A Cedarapids 25,000-pound vibratory roller, powered by a Case engine and towed by a Fordson Major diesel tractor, followed the spreader to reduce the 7 and 6-inch loose courses to 5 and 4 inches, respectively, and compact the material to the full depth in one pass. Additional surface compaction was supplied by two Bros Wobble Wheel 13-wheel rollers pulled by an International ID-9 tractor.

Just before the final rolling, each course was carefully shaped to line and grade by a Caterpillar No. 12 motor grader. The third or final course, rolled by a 12 to 15-ton Buffalo-Springfield three-wheel roller, finished the base.

This 26-foot-wide base course was finished with a 3-inch tilted surface before the 3¾ inches of bituminous paving was put down to a 24-foot width. Shoulders, 10 feet wide on both sides of the pavement, were built up with a 6-inch course of filter stone over the subgrade, and 7 inches of common borrow. When the paving was completed, the shoulders were brought up to grade with crusher-run rock, graded from 1 inch down, and applied with an Apsco spreader.

(Continued on next page)

Bituminous material is mixed in this Warren Bros. Model 602 portable plant, equipped with two dryers and a 3,000-pound batch-type pugmill. Aggregates are fed to the plant by a Koehring 401 with clamshell.



Here are important facts for the "man behind the gun"

This White 18" Dumpy level has ...more of the features you want, yet costs you less!

Before you buy, compare this White Dumpy level with a similar model of any other recognized make. From every standpoint — design detail . . . quality construction . . . work-speeding, life-lengthening features and cost — you'll quickly see why a White's the best buy you can make. It will make your work faster, easier, more accurate. Check this comparison chart:

FEATURES	D. White No. 7080	Instrument A	Instrument B
Magnifying power of telescope	35X	30X	27X
Distance away you can read 1/100 ft. graduation	1200 ft.	1050 ft.	900 ft.
Diameter of objective lens	1.81 in.	1.485 in.	1.69 in.
Field of view (in minutes of arc)	64'	52'	60'
Coated optics	YES	YES	YES
Covered leveling screws	YES	YES	YES
Can you easily replace worn leveling screws in the field?	YES	NO	YES
Sensitivity of level vial (in seconds of arc per 2mm of graduation)	20"	20"	25"
Price — complete with carrying case, tripod and accessories — F.O.B. factory	$305.00 *	higher	higher

For complete details on the 18-in. Dumpy level and other equally fine engineering instruments, see your David White dealer, or write direct to David White Co., 313 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

We offer complete, expert repair service on all makes, all types of instruments.

*Price subject to change without notice.

For more facts, circle No. 300

Morse-Starrett WIRE ROPE CUTTER

CUTS WIRE ROPE

FASTER . . . Especially designed cutting blade and dies assures fast cutting action. . . . . The hammer principle eliminates any special skill requirements.

CLEANER . . . No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

SAFER . . . The enclosed cutting blade locked in the body of the cutter assures perfect safety.

***and it's* PORTABLE . . .** Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1½ inch.

SEE YOUR DEALER OR WRITE DEPT. "M"

Morse-Starrett Products Company
1204 - 49TH AVENUE, OAKLAND 1, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 301

BROWN & ROOT, ENGINEERS:

"SOLVED OUR PROBLEM" WITH THE EXACT PILING THE JOB NEEDED

FOSTER RENTAL PILING SERVICE

Delivered the exact lengths of MP116 piling needed to prevent any danger of losing a dam through river floods or cave-ins on this cofferdam job. An efficient delivery assured contractors Brown & Root an uninterrupted work schedule.

Cofferdam construction for AUSTIN, TEXAS POWER HOUSE on Banks of Colorado River. Steel-sheet piling, supplied by L. B. Foster Co., was used in 35 to 40 ft. lengths to make up the cofferdam which will be filled with 120,000 cu. ft. of concrete.

"FASTER from FOSTER"

Get complete piling service from Foster —

the right type, the exact section, the exact length . . . and when you need it . . . on low, fixed expense of our RENTAL Plan.

STEEL-SHEET PILING
H-BEARING PILE • PIPE PILES
H-S LIGHTWEIGHT PILING

Write for Catalog C-4
RAILS • TRACK EQUIPMENT • PIPE FABRICATION
L. B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
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For more facts, circle No. 302

A Jersey spreader, pushed by a Cat D8, spreads base material more than 12 feet wide in a uniform layer. The spreader makes two passes to complete the 26-foot-wide roadway. *C&E Staff Photos*

(Continued from preceding page)

Plant produces base material

The crushing and mixing plant that produced the base material was set up in a quarry near the job, where the hard limestone rock was drilled by two Ingersoll-Rand wagon drills powered by an I-R 600-cfm Gyro-Flo compressor. Du Pont 60 per cent gelatin dynamite, which produced a well shattered rock, was used to load holes. A Koehring 605 shovel with a 2-yard bucket loaded the broken material into two Euclid 15-ton end-dumps that hauled to the crusher.

Rock was dumped onto a Cedarapids feeder which fed the 40×53 Cedarapids impact breaker. All material from this primary crusher was carried on a 165-foot Marco inclined conveyor to a Leco 6×16-foot four-deck vibrating screen mounted atop a 250-ton steel bin.

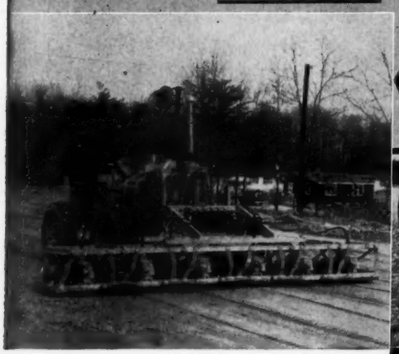
A sufficient quantity of fines was produced, since all primary crusher material retained on a 1¾-inch screen was fed to two big Cedarapids 33×40 hammermills. It was sometimes necessary to feed some of the minus-1¾-inch material to the hammermills, each of which was driven by two General Electric 200-hp slip-ring electric motors. Material reduced in the hammermills was returned to the screens and mixed with the material coming from the primary crusher.

Two Syntron feeders brought crushed rock from the bins to a Marco belt conveyor leading to the pugmill on the mixing platform. Calcium chloride was fed onto this same belt by a Syntron feeder operating from a small hopper. Pellet calcium chloride, fed by hand from sacks to the hopper, was metered out to the mix at the rate of 100 pounds to 21 tons of rock.

The pugmill in which the rock, calcium chloride, and water were mixed was set up on a platform so that trucks were able to drive underneath for loads. Water was normally added at the rate of 5.5 to 6.5 per cent, depending on the amount of moisture in the rock. The amount of moisture added was regulated so that the mix had an optimum moisture content as it was delivered to the road. A fleet of 12 to 15 dump trucks hauled the material from the plant to the road at a rate of about 3,000 tons per 9-hour day. Loads were weighed at the plant on a Howe 40-ton truck scale.

The rock production and processing operation was conducted as a subcontract job by Clement Bros Co.,

BASE COURSE DENSIFICATION at its *QUICKEST* and *BEST*



6 COMPACTING UNITS IN WORKHEAD for maximum productivity in straight-away work. Left: Compacting sand fill in a bridge approach . . . another phase of its wide range utility to paving contractors.

4 COMPACTING UNITS just fit this widening job-change required in only a few minutes.

3 COMPACTING UNITS in tandem and staggered, suits this job ideally — a quick and easy change.

1 COMPACTING UNIT fitted with operating handle and narrow base. Just right for the otherwise unreachable spots.

2 COMPACTING UNITS in twin hook-up — self-propelling. One man readily compacts up to 4000 sq. ft. per hr. in 10" layers.

Plus* UNMATCHED ON-THE-JOB *ADAPTABILITY!

For consolidating granular soil sub-bases and the base courses of sand, gravel, rock or slag in waterbound and penetration macadam construction, there is just nothing that compares with the Jackson Vibratory Multiple Compactor. It not only does the straight-away work in only half the time required by equipment of other types, but is so versatile, so easily adaptable on the job that it can be used to great advantage for widening projects of any width and getting into places other equipment can not touch. As may be noted in the illustrations, any number of compacting units may be used in the workhead (up to 6, which covers 13', 3") to exactly fit the job at hand. Units may be towed at the side or fitted with operating handles and used as individual, self-propelling compactors. Quickly interchangeable bases from 12" to 26" are also available for compacting in trenches, etc.

For compacting granular soil fills of all kinds, the Jackson Multiple Compactor is a terrific cost saver and progress expediter. *It's the predominant medium of consolidation used on the outstanding paving jobs in the country today.* See your Jackson distributor for complete details. We will gladly furnish his name, and literature, on request.

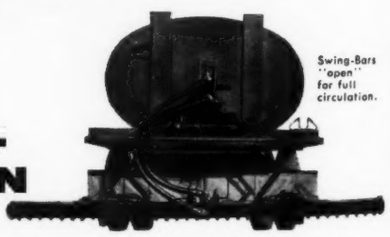
JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 303

AIR-SNAP SPRAY BAR SHUT-OFF

Eliminates "fat" and "lean" Spots . . .

"FULL-SIGHT" Operation



Swing-Bars "open" for full circulation.

Swing-Bar Distributor
Product of
SEAMAN-GUNNISON
BARABOO, WISCONSIN

- Exclusive AIR-SNAP Spray-Bar provides quick opening and closing . . . no lean spots at starting line; no dripping after shut-off. Assures positive rate of bitumin application.
- Swing-Bar moves up or down, right or left. Outer sections turn back full 180° for transport and swing back when encountering obstructions (prevents damage to equipment).
- Air-Snap Valve operates on compressed air, controlled from operator platform.
- Each 3-ft. section selectively controlled.
- 800, 1000, 1250, and 1500 gal. cap., truck-mounted tanks.
- 1500, 1750, 2000, and 3000 gal. cap., semi-trailer mounted tanks.

Also, get details on new DUO-PACTOR, a 6 to 19 ton Combination Steel and Pneumatic Roller.

SEAMAN-GUNNISON CORPORATION
BARABOO, WISCONSIN

Send full details ☐ Bituminous Distributor ☐ Duo-Pactor, to:

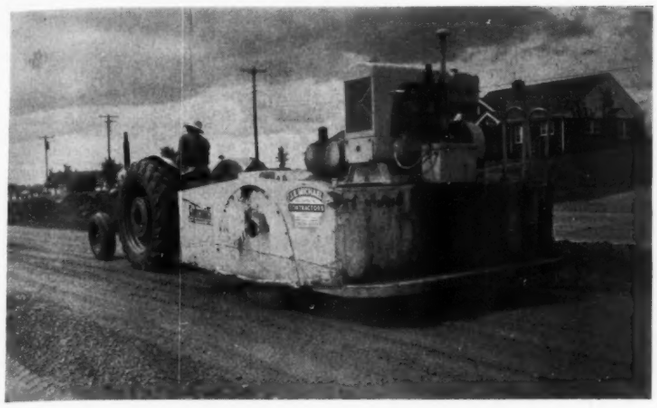
Name.....

Address.....

City.....State.....

For more facts, use Coupon, or Reader-Reply Card opposite page 18 and circle No. 304

Initial compaction of each course is done by this Cedarapids 25,000-pound vibratory roller, pulled by a Fordson Major diesel tractor. The roller, powered by a Case engine, compacts material to full depth in one pass.



Lenoir, N. C., and James F. Clement, one of the owners, supervised the operation personally.

Bituminous pavement

When the base had been brought to proper grade and thoroughly compacted, the surface was primed with MC-1 cutback asphalt at the rate of 0.30 to 0.45 gallon per square yard. This prime, and the fog tack coat of RC-1 that was later applied to the binder, was shot by an Etnyre 1,000-gallon distributor.

A course of asphaltic-concrete binder was next laid down at the rate of 250 pounds per square yard. This mix consisted of crushed-rock aggregate, graded from 1½ inches down, with the addition of about 4.5 per cent of 85 to 100-penetration asphalt cement. The binder was laid by a Barber-Greene finisher and compacted with Buffalo-Springfield 8 to 10-ton tandem rollers.

The wearing course, laid at the rate of 125 pounds per square yard, consisted of crushed stone graded from ⅜-inch down to dust, plus 40 per cent natural sand. The same type of asphalt cement in the binder was used for the wearing course, but the amount was increased to about 6 per cent. This material was put down and rolled by the same equipment that laid the binder.

The bituminous paving was done by Warren Bros. Road Co., Cambridge, Mass. Binder and wearing course mixes were produced in a Warren Bros. Model 602 portable hot-mix plant set up near the Franklin Limestone Quarry about 15 miles from the job. Several other projects were handled from this same location.

The plant had a 3,000-pound batch-type pugmill and two dryers. Although it was rated at a capacity of 70 tons per hour, the plant consistently produced more than 100 tons of the binder mix hourly.

Aggregates delivered by truck from the nearby quarry were charged into a two-compartment 30-ton bin by a Koehring 401 crane with a Blaw-Knox 1-yard clamshell bucket. Two electric vibrating feeders fed the boot of a bucket elevator that carried the materials to the dryers. The hot elevator took the aggregates from the dryers to a Hewitt Robbins three-deck gradation unit, and then to the hot bins. Aggregates and asphalt cement weighed out in separate Fairbanks scales were delivered to the pugmill for mixing.

Two Caterpillar D13000 engines powered the dryer, pugmill, and cold elevator. The rest of the plant was electrically operated. A Cleaver-Brooks 80-hp steam boiler provided steam for the burners and for heating the asphalt storage tanks and weigh equipment. Both boiler and burners used No. 5 fuel oil.

Personnel

Superintendent of the base operation for J. B. Michaels & Co. was Felix Sherrod. James F. Clement of Clement Bros. Co. supervised the production of the crushed rock base material. Arthur Lee was superintendent of the bituminous operation for Warren Bros. Road Co. Bob Elizer was foreman of the hot-mix plant.

This job was under the supervision of District 3 of the Tennessee Department of Highways and Public Works, which has J. B. Ramsey as division engineer. Project engineer on the job was D. M. Dougherty. He was assisted in the field by E. E. Jernigan and Lennel Patton, senior inspectors. The state highway engineer is H. M. Bates.

THE END

NOW
OVERHEAD PLUS
FRONT-END LOADING
COSTS NO MORE
with
LODOVER

This versatile combination overhead and front-end loader costs no more than conventional front-end loaders . . . yet loads *more* dirt, *faster* with your International T-9 or TD-9 than any other loader on the market today!

ONLY LODOVER GIVES YOU

50% MORE YARDAGE—no-turn overhead operation eliminates two turns every cycle, doubles yardage every hour

EXTRA DIGGING POWER—twenty-five degree bucket tilt-back at ground level pries out a full bucket every time

REDUCED TRACTOR MAINTENANCE • SAFE, EASY HYDRAULIC OPERATION • HIGH-SPEED FRONT-END LOADING

• A complete line of job-tested attachments makes Lodover the most versatile multi-purpose unit you can buy to boost profits on your job. An on-the-job Lodover demonstration will convince you . . . arrange for one today!

SERVICE SUPPLY CORPORATION
20TH & ERIE AVENUE • PHILADELPHIA, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305

CONTINENTALS GIVE YOU
ALL THE THINGS
that add up to
DEPENDABLE POWER

QUALITY assured by more than 50 years' experience in specialized internal combustion power.

•

ENGINEERING with each specific application in mind.

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SPECIALIZATION that does away with hit-or-miss matching to the job.

•

PARTS INTERCHANGEABILITY for quick replacement, with minimum down-time.

•

AUTHORIZED SERVICE and genuine Red Seal parts available from coast to coast.

By standardizing on Continental Red Seal engines, you get ALL THE THINGS that add up to dependable power. There's a Red Seal model engineered and built for almost every application in transportation and industry, as well as on the farm. Overhead-valve and L-head models for use with all standard fuels are available as bare engines or as power units, open or closed. Bulletins and full information on request.

SERVICE
AND GENUINE RED SEAL PARTS
SOLD EVERYWHERE

IN ADDITION TO ITS LARGE ENGINES, Continental builds an outstanding line of heavy-duty air-cooled four-cycle models for industrial and farm applications requiring 2 to 3 h.p. Advanced engineering gives them easy starting, high dependability, and unusual lugging capacity at low speeds . . . Options: patented and exclusive Conlox® external ignition system, low-level ignition cut-off, 6-1 reduction gear, and other features. Available also for use on kerosene . . . For information on these models, address Air-Cooled Industrial Engine Division, 12800 Kercheval Ave., Detroit 15, Michigan.

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VERTICAL SHAFT

Continental Motors Corporation
MUSKEGON • MICHIGAN

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6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.
1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

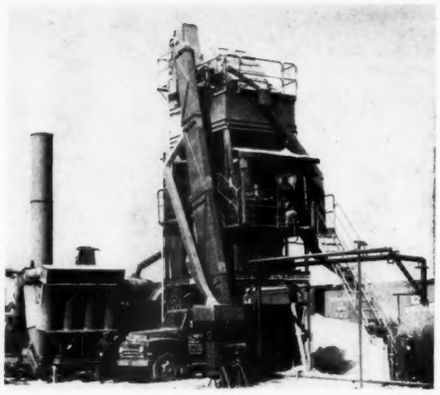
For more facts, use Reader-Reply Card opposite page 18 and circle No. 306

Add 1, 2, 3-ton units to asphalt-plant line

■ The BatchOmatic line of automatic bituminous batch plants now includes 2,000, 4,000, and 6,000-pound-capacity models, according to an announcement by the Barber-Greene Co. These new 1, 2, and 3-ton units augment the BatchOmatic line of 15 to 200-ton-per-hour continuous-mix plants.

The new units are said to employ the regular B-G features of simultaneous weighing of all sizes of aggregate, instant change from fully automatic to manual operation, the Dyna-Mix pugmill, and instant, positive inspection of aggregate gradation and weight.

A complete range of sizes of dryers, dust collectors, elevators, and aggregate cold-feed system for the new BatchOmatic plants are available. These are the same units used with Barber-Greene continuous-mix asphalt plants, which range in capacity from 15 to over 200 tons per hour.



BatchOmatic plants feature simultaneous weighing of all sizes of aggregate, as well as instant change from fully automatic to manual operation.

For further information write to Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 90.

Waco Mfg. acquires four affiliate firms

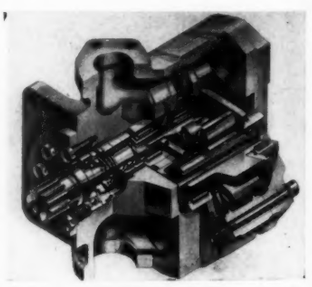
The Waco Mfg. Co., Minneapolis, Minn., manufacturer of scaffolding, shoring, and concrete forms, has acquired four affiliate companies. The new move will make Sico Grandstands, Inc., Waco Rental Co., Inc., Waco Finance Co., Inc., and Waco Scaffolding Co., Inc., wholly-owned subsidiaries of the parent company.

In connection with the merger, eight promotions were made within the organization. Charles J. Hoover, president of Waco Scaffolding, Inc., has been made vice president and treasurer of Waco Mfg. The former manager of manufacturing, Dean B. Chenoweth, has been appointed vice president in charge of manufacturing, and Neil M. Clark, former chief engineer, was promoted to vice president in charge of engineering and research. The new chief engineer is Arthur F. Allen.

LeRoy R. Shellum will serve as assistant treasurer, Mary B. Weber as assistant secretary, and A. E. Stiff as manager of the bleacher division. Fred R. Prouse was appointed vice president of Waco Scaffolding.

Line of heavy-duty hydraulic pumps

■ The Hydreco Division of The New York Air Brake Co. has developed a new series of 150-hp, 1,500-psi hydraulic pumps for heavy mobile and industrial equipment. Pumps in the new Series 3600 are especially engineered for installations where space is extremely limited and where adverse conditions exist.



Cut-away drawing of the new Hydreco 150-hp hydraulic pump.

The new pumps will deliver 64, 90, or 110 gpm at 1,200 rpm, depending on the model. Speeds range to 2,000 rpm, pressures to 1,500 psi, and fluid horsepower to 150. Companion control valves have also been designed for the new high-volume series.

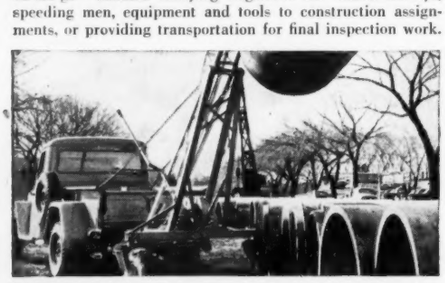
According to the manufacturer, extensive field tests on a wide range of equipment have been run over the past two years, with results showing between 75 and 85 per cent reduction in pump and accessory maintenance with the new Hydreco pumps, compared to similar equipment.

For further information write to Hydreco Division, New York Air Brake Co., 1100 E. 222nd St., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 53.

All-wheel traction. With the extra traction of its 4-wheel drive, the 'Jeep' Truck is an all-purpose, performance-proved workhorse for moving men, tools and equipment to or around construction sites. It carries more than a ton of payload, on the road or off—in low-low gear climbs grades as steep as 60°, fully loaded—tows heavily-loaded trailers where other vehicles can't go.

Contractors save time and manpower with 'Jeep' versatility and all-wheel traction!

Transportation. The 4-Wheel-Drive Universal 'Jeep' is always on-the-go—whether carrying engineers for initial surveys, speeding men, equipment and tools to construction assignments, or providing transportation for final inspection work.



Mobile power. Taking power to the job, on-the-road or off, is simplified with a rugged 4-Wheel-Drive 'Jeep' Truck equipped with power take-off and crane, or other specialized equipment. It also operates welders, compressors and generators.

In every phase of construction, whether travelling through deep fill with men and tools, or operating earthmoving equipment, 4-Wheel-Drive 'Jeep' vehicles save time and manpower, help keep work on schedule every day of the year, good weather or bad.

These time-tested rugged vehicles provide a mobility and range of performance that is unmatched. The extra traction of their 4-wheel drive provides the go-anywhere power that keeps tough jobs moving. 'Jeep' vehicles go where other vehicles can't in the heavy, rough going of the construction project. Then, on the highway, a flick of the selector lever shifts them into conventional 2-wheel drive for travel at top legal speeds. With power take-off or hydraulic lift, they provide on-the-spot power to operate many types of equipment from dozer blades to back hoes.

Economical 'Jeep' vehicles supplement heavy-duty equipment, spread their cost over a wide variety of jobs, give you additional savings through long life and low maintenance costs. Ask your Willys dealer for a practical, on-the-job demonstration.

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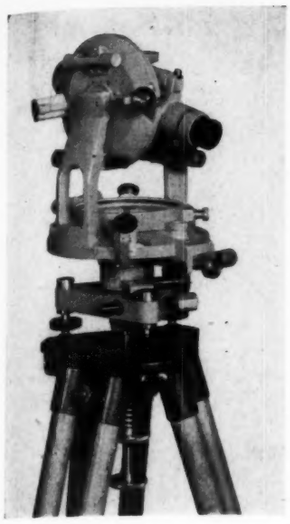


New surveying transit for all-weather work

■ A new engineer's compass transit featuring an optical plummet which makes it easier to set up in windy or other adverse weather conditions is offered by the Geo-Optic Co., Inc.

Other features of this high-precision instrument include an erecting eyepiece, double-center ocular prism, and four screws. The instrument permits reading on the horizontal circle to 30 seconds, and on the vertical circle to one minute.

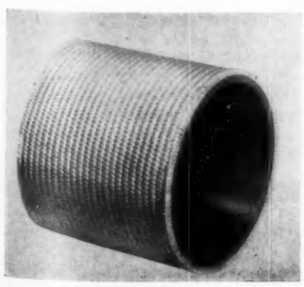
For further information write to the Geo-Optic Co., 170 Broadway, New York 38, N. Y., or use the Request Card at page 18. Circle No. 10.

Lightweight air hose of synthetic materials

■ A new lightweight hose constructed entirely of synthetic materials has been developed by Quaker Rubber Corp,. Division of H. K. Porter Co., Inc. Originally developed for use at elevated temperatures in keeping jet engines heated and ready for immediate use, it is expected to have wide application in the construction and maintenance fields because of its strength, light weight, and flexibility.

According to the manufacturer, the hose is capable of handling air continuously at temperatures up to 400 degrees F and working pressures of 100 psi. It can be furnished with inside diameters of from ¾ inch to 5 inches in lengths up to 50 feet.

For further information write to the Quaker Rubber Corp., Division of H. K. Porter Co., Inc., Tacony and Comly Sts., Philadelphia 24, Pa., or use the Request Card at page 18. Circle No. 7.



Quaker lightweight hose.

New abrasive blade cuts green concrete

■ Champion's new reinforced abrasive blade, the Con-Flex, is designed specifically for concrete sawing, according to the manufacturer.

The first of a series to be marketed is the Con-Flex C-300, which is recommended for cutting green concrete with aggregates of limestone, dolomite, or slag.

Cutting green concrete with Con-Flex blades must be done as soon as the concrete can hold the weight of the machine and operator, the company advises. This operation should be done within 6 to 12 hours after pouring, depending on the temperature and other job conditions.

For further information write to Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., or use the Request Card at page 18. Circle No. 62.

The new Con-Flex abrasive blade.

Crushers; grinders

■ A variety of crushers, grinders, and shredders manufactured by the Pennsylvania Crusher Co. are described in a new bulletin. The equipment featured includes reversible hammermills, reversible impactors, ring-type granulators, single roll crushers, jaw crushers, gyracones, feed mills, and process grinders. A picture of each unit, a diagram of how it operates, a brief description, and an explanation of various uses of the unit are included.

To obtain Bulletin 4006 write to the Pennsylvania Crusher Co., Division of Bath Iron Works Corp., 323 S. Matlock St., West Chester, Pa., or use the Request Card at page 18. Circle No. 76.

Cleveland "Baby Digger" averages 3,500′ of 22″ x 36″ water line trench daily, digging in clay and rock

R. L. Eatherly of Carthage, Tenn. got good daily trench production with his Model 95 Cleveland "Baby Digger" on this water line contract in the Belshire Subdivision in Nashville. Averaging 3,500 feet per day, the Cleveland cut 4 miles of trench, 22 inches wide by 36 inches deep in curving roadways on a subsoil composed of clay with fairly heavy rock content. The Cleveland's completely unobstructed operator visibility and the convenient grouping and location of its controls for easy accurate digging were definite advantages in cutting the curved trench. Just another example of the outstanding ability of Cleveland Trenchers to *dig more trench . . . in more places . . . at less cost.*

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A continuous pour is made on the North Channel swing-span rest pier with a 25-foot-long 16-inch-diameter tremie pipe. The cofferdam will be dewatered 14 days after the 10-foot-thick seal has been placed.

Changes in method im

By suspending a prefabricated steel frame between two derrick barges, then pinning it to the bottom of the bay, Merritt-Chapman & Scott Corp., New York, N. Y., eliminated the need for piles to support a cofferdam frame during construction of the 36 river piers for the 4-mile rail crossing being built across Jamaica Bay, New York, for the New York City Transit Authority.

Then, switching to an even more simplified method, the contractor eliminated the need for the frame by completing pile driving, then building the cofferdams.

Both these changes were made after the contractor had started the work, using timber piling as a support for the cofferdam frame. These piles were driven on 10-foot centers along the net line of the cofferdams, then cut off at the same elevation. Then 12 × 12-inch timber wood sills were placed

SHORT CUT
To Speed Construction

One of the big advantages of Naylor Spiralweld pipe and one-piece Naylor Wedge-Lock couplings is the speed with which lines can be made up in dredging operations and for handling air and water on construction jobs.

This pipe and coupling combination gives you lines that can be installed easier and faster than by any other method. A hammer is the only tool needed to assemble or disassemble connections. In tunnel work, lines hug the wall and space is saved as they can be made up with only one side of the pipe in the open. In addition to faster installation, there is the factor of high salvage and re-use value to consider.

For the complete story, ask for Bulletins No. 507 and No. 513.

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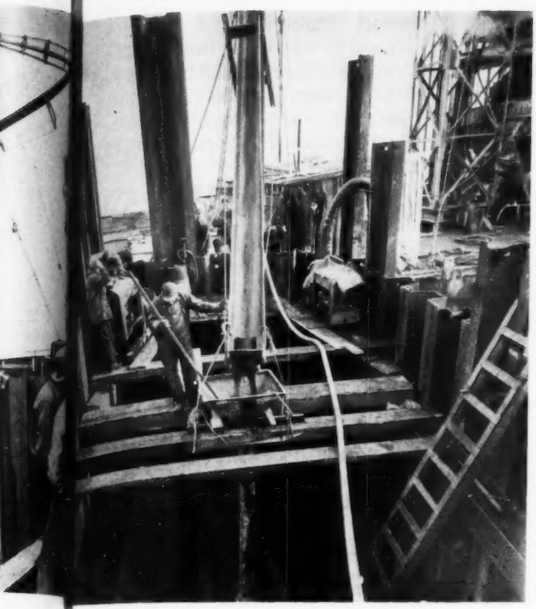

The tremie seal placed, the cofferdam dewatered by 10 and 6-inch pumps, and the timber bearing piles cut off 1 foot above the seal, workmen start pouring a reinforced-concrete distribution block for a pier.

hodimplify cofferdam work

Piers are built for 4-mile New York City rapid-transit line across Jamaica Bay; new access to Rockaway Beach will open this summer

on top of the piles to form a support for the cofferdam frame. This technique was abandoned for the faster method after work had been done on seven river piers and six large bridge piers for the two swing spans of the project.

Dredges provide access

Work on this new line across Jamaica Bay was started in November, 1953, by the transit authority, which had bought the Rockaway Division of the railroad after a fire destroyed ½ mile of trestle and the run from Jamaica to the Rockaways was abandoned. Barges working on cofferdam construction used a 90-foot-wide and 10-foot-deep channel, which had been dredged alongside the 11,000 timber piles that formerly supported the old rail link. Dredging of about 90,000 cubic yards of bay bot-

(Continued on next page)

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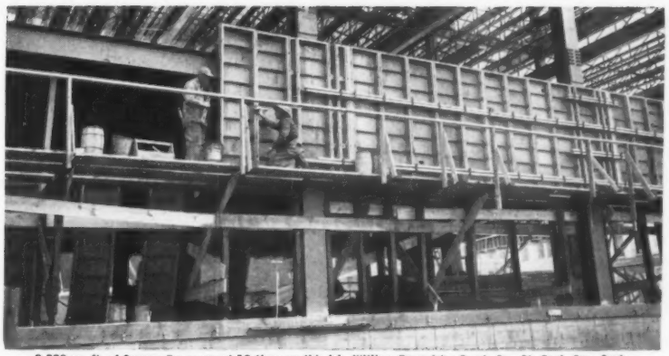

9,000 sq. ft. of Symons Forms reused 12 times on this job. William Baumeister Const. Co., St. Paul, Gen. Cont.

Spandrel Beam Forming Cost Cut 2/3 with Symons Forms

Because of the efficient combination of Symons forming, shoring and scaffolding methods, the contractor was able to cut his estimated cost by two-thirds on the $2,000,000 home office building of the Minnesota Mutual Life Insurance Company of St. Paul, Minnesota.

In addition to savings in labor cost, considerable time was saved in forming the Spandrel Beams of this 9-story building. The adaptability of Symons Shores with their safe "T" heads speeded the forming and scaffolding work. 2 x 8 ft. Symons Steel Rib forms were used to frame 56,000 square feet of Spandrel Beams. Symons Shores were used throughout in beam construction. All foundation walls are 16 feet in height.

Send for our Catalog F-10 which gives complete information on Symons Forming. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. D-6, Chicago 39, Illinois.

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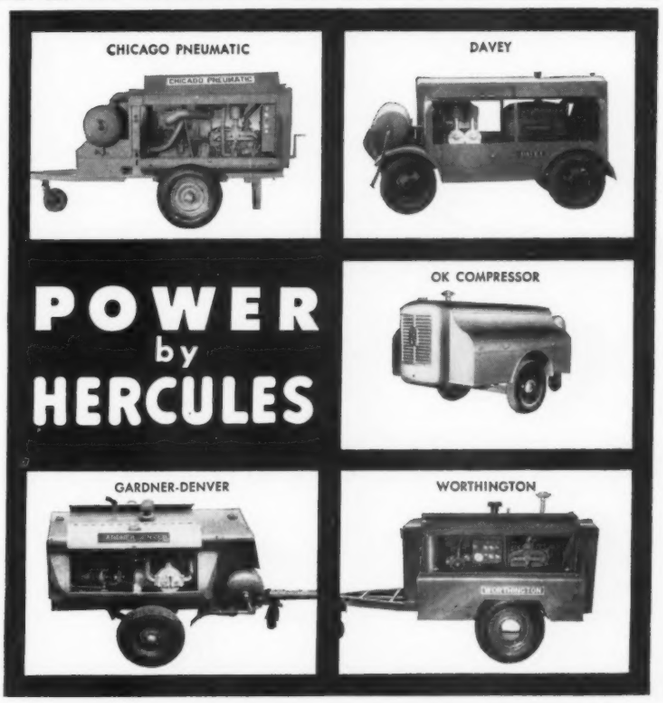

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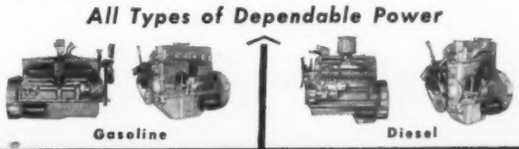

Gasoline Diesel

HERCULES MOTORS CORPORATION, Canton, Ohio

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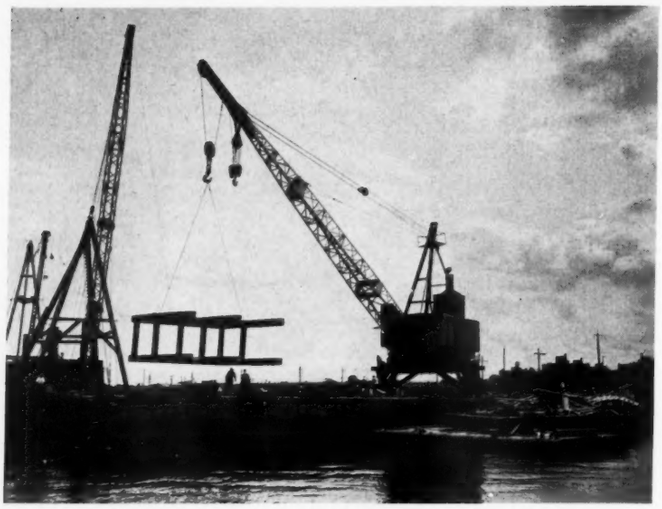


Falsework for the support of concrete forms is loaded onto a barge at the contractor's yard by an American R-25 revolver powered by an Erie 90-hp boiler. *C&E Staff Photo*

(Continued from preceding page)

tom, done through a 10-inch discharge, made it possible for barges to remove the old piles before the substructure project was started.

Another dredging operation, also done before bridge and trestle construction got under way, was handled by the Atlantic Gulf & Pacific Co., New York, N. Y. This involved pumping of three million cubic yards of hydraulic fill to form a long finger-shaped island, 350 feet across at its widest point, and 10,400 feet in length, and a second island, 1,000 × 2,300 feet. These two islands will provide an earth roadbed for the tiles and rails of the proposed subway link. The old crossing ran over 3½ miles of water.

Cofferdam work

The steel frame used by M-C&S in cofferdam construction was assembled in the contractor's yard at Hammels, N. Y. On the bay, it was suspended between two derrick barges and set to correct line and grade. Then temporary 10-inch H-piles were driven at the corners of the frame, vertically and at a batter, to pin the frame into position. Steel sheeting was driven around the frame to form a cofferdam and alternate sheets were bolted to the frame.

Approximately 109,000 linear feet of Z-type sheeting, 18 inches wide and weighing 40.5 pounds per foot, were driven around these frames to a penetration of 20 feet to form the various sizes of cofferdams. This sheeting, furnished by Bethlehem Steel Co., was shipped to New Jersey by rail, then transferred to a scow that made deliveries to the site.

The North and Beach channels, both with swing span structures, required a total of 30 cofferdams, measuring 31 × 16 feet, that were spaced on 80-foot centers.

Four cofferdams, two for each of the bridge rest piers, were 65 × 23 feet. The pivot piers for each bridge were both 41 feet wide, but one was 80 feet long, and the other, 77 feet long.

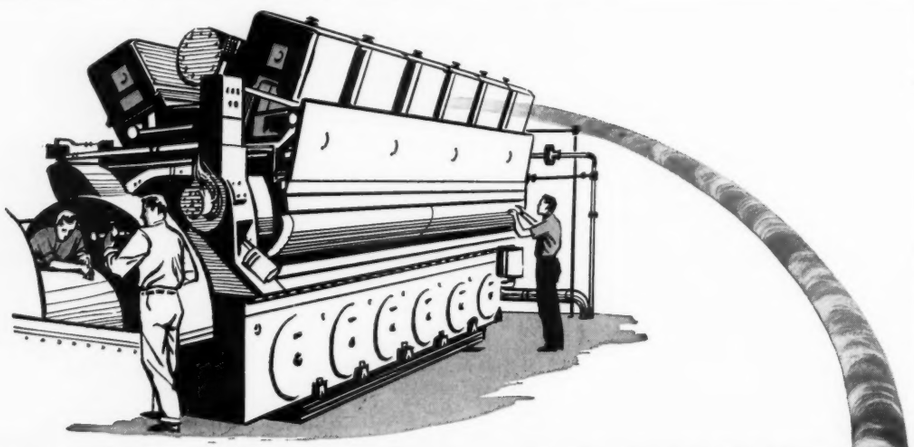
The third channel, known as Broad channel, is crossed by a low-level concrete trestle on bents spaced 22 feet on centers. These bents consist of six 24 × 24-inch precast, reinforced-concrete piles per bent.

Work sequence changed

After the change in the method of constructing the cofferdams, the contractor made another switch in operations. At first, untreated piles averaging 60 feet in length and having 8-inch tips and 16 to 18-inch butts, were driven after cofferdams had been constructed. Jetting was needed to get these piles to the required 30-ton bearing and 30-foot penetration within the cofferdams. Piles were positioned on 3-foot centers by a template consisting of 12 × 12-inch timbers in a checkerboard pattern, then driven by a McKiernan-Terry S-5 single-acting hammer on a barge-mounted crane.

Changing to a new method, that required no jetting, the contractor drove the piles first with a floating pile driver, then built the cofferdams. The timber piles were set up between two channel leads, 72 feet high, on a wooden barge. Sliding between the leads was a 15-foot runner, 27 inches wide, that handled a double-acting steam hammer. This was a McKiernan-Terry 10-B-3, 10 feet long, powered by steam at a 125-pound pressure.

The leads were set as winches took up or slacked off on the six anchor lines to position the barge. The end



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corner falsework piles were driven first, establishing a base line for the remainder of the piles. About 55 piles were needed for each trestle pier, 132 for the rest piers, and 320 for the pivot piers.

Supporting the framework on the four corner falsework piles after all the piles had been driven proved to be the easiest method of constructing the cofferdams. With the framework in place, the sheeting was driven, then bolted to the framework.

Placing tremie seal

As soon as the cofferdam and timber bearing piles were in place, an airlifting operation was used to remove the sand to required subgrade within the cofferdam. This was done with an 8-inch pipe, about 30 feet long, that had a 1-inch pipe welded along its entire length. Air was forced down the 1-inch pipe at a pressure of 100 psi, forcing the column of water to rise in the 8-inch line. The vacuum created in the larger line caused sand from the bottom of the cofferdam to rise behind the water column so that it could be ejected through a horizontal section of pipe located above the water level. The air-lifting operation allowed a 6-foot-thick tremie seal to be placed within the cofferdams for the small piers and a 10-foot-thick tremie seal to be placed for the bridge piers.

Tremie concrete was completely processed on the water by five barges making up the batching plant. These included a barge with a concrete-mixing plant, a water barge, a sand barge, and aggregate barge, and a cement barge. On the concrete-mixing barge were two mixers, a Smith and a Ransome, each turning out 1-cubic-yard batches. The water barge had a 100,000-gallon capacity. Sand and aggregate were transferred from barges to the plant hopper by a barge-mounted crane with clamshell bucket.

A feature of the concrete setup was the use of special bulk cement that was supplied in containers made by the L C L Corp., New York, N. Y. M-C&S used about 66 of the 50-barrel steel containers to supply the floating plant with cement. The cement was removed from the containers by an air stream, activated by a 600 cfm compressor, which entered the containers through a 1½-inch intake and forced cement out through a 4-inch outlet. Cement was led through a flexible hose to a rubber hose, then to the cement hopper of the batch plant. The sealed containers, which took about 20 minutes to empty, made it possible for operations to continue in all types of weather.

Concrete with a slump of 6 inches was poured into the cofferdam through a 16-inch-diameter tremie pipe about 25 feet long. Before a pour was started, a bag of straw was dropped into the tremie pipe. Then as a pour began, the weight of the concrete pushed the bag, and the water ahead of it, out of the pipe. Pours were continuous, except for those for the large pivot piers. These required the tremie pipe to be raised four

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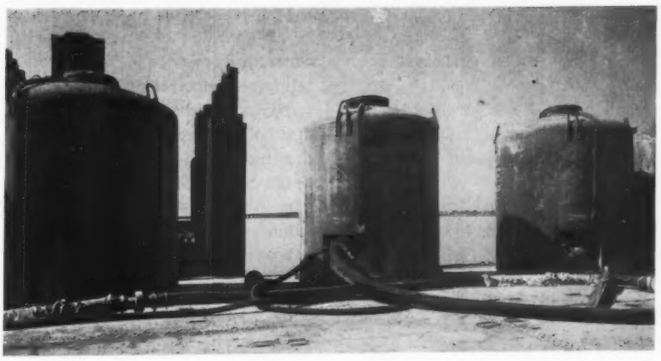
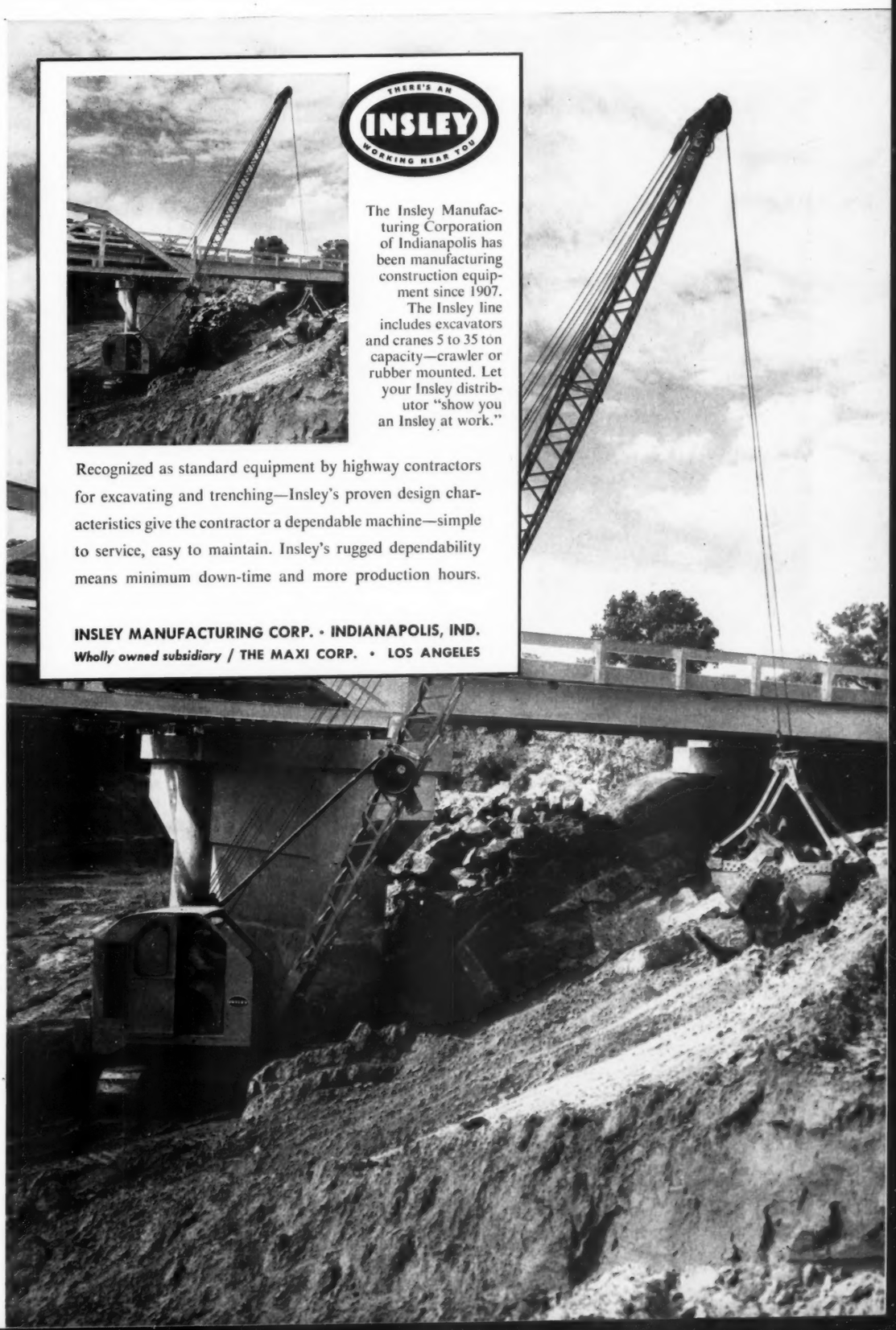
For more facts, circle No. 317→



Cement for the project is delivered in these 50-barrel containers, made by the L C L Corp., New York, N. Y. Compressed air, pumped into the containers through a 1½-inch line, forces cement out through a 4-inch line. Use of the containers made it possible for work to continue in all kinds of weather.



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(*Continued from preceding page*)

times. The longest continuous pour took 30 hours.

Cofferdams were dewatered two weeks after a tremie pour by a 10-inch and a 6-inch pump having capacities of 15,000 gpm and 9,000 gpm, respectively. To reduce the amount of leakage through the cofferdam, the contractor dropped pulverized steel cinders on the outside of the sheeting, below the 10-foot water level. The cinders, passing through the interlocks of the sheeting, tended to block any voids and prevented excessive leakage. Though this helped a great deal, a 2-inch pump was also used to remove additional leakage in the cofferdams.

Once the water had been removed the timber bearing piles were cut off at an elevation of 1 foot above the concrete tremie seal. This allowed a reinforced-concrete distribution block to be poured on top of the tremie seal, and both to become structurally tied together. The distribution block heights varied; for the high trestle piers, the average height was 4 feet, while on the larger bridge piers, the height varied from 8 to 10 feet.

Above the distribution block, a 12-foot-high wrought-iron protection ring, ½-inch thick, was placed, then filled with concrete from the floating batch plant. The top of this protective wall was designed to be 3½-feet above mean high water. The remaining designed height of the pier was formed with lumber formwork and completed in one lift.

The remaining substructure work in this contract involved driving a total of 904 24 × 24-inch precast piles, both in Broad channel, a 1,254-foot-long water crossing, and for the approaches to the North and Beach channel swing spans. Pile bents, consisting of 6 piles, are spaced on 22-foot centers. The precast piles, formed in the contractor's yard, had to be aged 60 days before they could be driven.

Both the 276-foot North Channel swing span bridge and the 300-foot-long Beach Channel swing span bridge provide two 100-foot channels for navigation. Shafts for the pivot piers are 37 feet in diameter, and additional support wings support circuit breaker and pull chamber houses. Approximately 3,500 cubic yards of concrete was used for the North Channel pivot pier, and 4,000 cubic yards for the Beach Channel pier. Clear vertical distance under the swing spans averages 26 feet, above mean high water. All steel erection and the bridges and high trestles was done by American Bridge Co., a subsidiary of U. S. Steel Corp.

Roadbed slabs precast

One of the big time and labor-reducing features of the pile-bent trestle job was the method of precasting roadbed slabs. These are 14 feet 7 inches wide, and 21 feet 4 inches long, and two slabs, set side by side, are needed to complete each span. The 8½-inch-thick reinforced slabs were precast monolithically with two 3-foot 1-inch-deep girders for longitudinal stiffening. Each slab, weighing approximately 39 tons, was precast in the contractor's yard in special prefabricated portable steel forms, placed so that the slab was poured upside down. In this way, the casting bed acted as a form. Concrete delivered to the forms by Transit-Mix Concrete Corp., New York, N. Y., was emptied into a 2-yard concrete bucket that was handled by a gantry crane. The casting bed had openings to fit the heads of Richmond bolts, which were screwed into Richmond screw anchors before the concrete was placed. The same device was used on each end of the slab girders for lifting purposes. A curing compound, Dura-Cure, was sprayed on the freshly poured concrete so that forms could be stripped after 24 hours.

When forms were removed, the slab was turned right-side-up by means of a rolling block attached to the Richmond bolts at one of the slab. The bolts screwed into the face of the slab were used in picking up a slab and loading it onto a barge for the trip out to the new trestle. The bolts also served as pickup points as slabs were placed on the pile bents. Then they were easily unscrewed from the embedded screw anchors. Holes left after the bolts were removed were later grouted. A total of 331 slabs were precast and handled on the project in this manner.

The yard gantry crane, an American R-25 revolver riding on rail tracks set 30-feet apart, had a 95-foot boom with a 15-foot jib. An Erie 90-hp boiler powered the 50-ton-capacity rig, which loaded barges with all precast slabs, piles, pile caps, cement containers, or other equipment needed on the water.

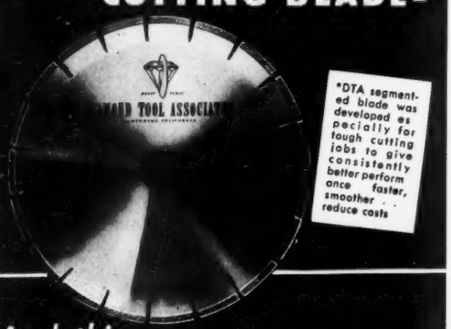
The driving of 1,500 creosoted timber piles for the elaborate fender racks protecting the two swing spans was one of the last operations done. About 500,000 board-feet of treated lumber was used to complete this job. Work now in progress and being done under separate contracts, includes the preparation of the island roadbeds, the laying of rail ties and track, and the building of the concrete roadbed on the steel superstructure of the high trestle piers in Beach and North channels.

Personnel

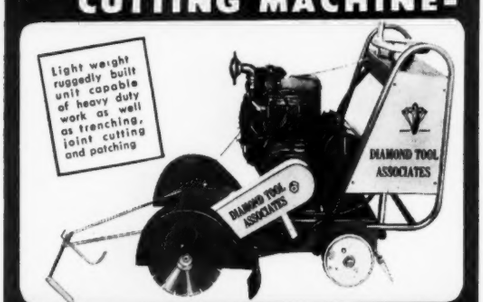
R. M. Hand was the project man-

To do this
CUTTING JOB BETTER-

You need this
CUTTING BLADE-


*DTA segmented blade was developed especially for tough cutting jobs to give consistently better performance . . . faster, smoother . . . reduce costs

And this
CUTTING MACHINE-


Light weight ruggedly built unit capable of heavy duty work as well as trenching, joint cutting and patching
DIAMOND TOOL ASSOCIATES

and of course they're both DTA*

6 BIG REASONS WHY *DTA IS YOUR BEST BUY
1. Outstanding research and development.
2. Precise control of manufacturing process.
3. Highest quality diamond BOART.
4. The best in metal bondings.
5. Top quality steel centers.
6. Complete sales and field service by experienced personnel selected for their knowledge of your cutting problems.

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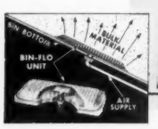
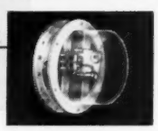
For more facts, circle No. 318

BULK MATERIAL CONTROL
under
Pressure or Vacuum

New Roto-Bin-Dicator mounts outside bin, at any angle, for bin level signaling or machinery control. Material loads on paddle actuate Micro switch in motor housing. Flexible paddle shaft permits use with large or lumpy materials when standard diaphragm indicators are impractical.



BIN-DICATOR
BIN-FLO AERATOR



Low pressure air diffuser assures steady flow of fine, dry materials that tend to pack in storage.

The original diaphragm-type bin level indicator for all ordinary applications.

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Soil Testing Check Sheet

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If you are interested in any or all of these tests, you'll want to get the facts about the new Olsen KW line of soil testing equipment —designed for rapid, convenient testing . . . one man operation . . . compact, light weight and portable.

Get the facts. Write for Bulletin 50 today.

TINIUS OLSEN TESTING MACHINE CO.
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ager for Merritt-Chapman & Scott Corp., which had approximately 250 men on the project. George Mears was the project engineer; M. Stinchcomb, yard superintendent; and John Tooker, marine superintendent for M-C&S. Victor Lefkowitz is the project engineer for the New York City Transit Authority. THE END

H. H. Rappaport forms new construction firm

A new construction firm dealing in technical projects, has been organized by Herman H. Rappaport. Temporarily located in Torrance, Calif., the firm will specialize in tilt-up and prestressed concrete, process, and mechanical construction.

Tilting mast avaliable for fork-lift unit

■ The Kwik-Mix Co. has announced an important improvement to its Model S-10 Moto-Bug. Future production models of the three-wheel fork-lift unit can be equipped with an optional double-acting hydraulic valve that enables the operator to tilt the mast and raise loads with one hand.

The manufacturer claims this device provides an increase in usefulness for the Moto-Bug in handling materials on construction and other job applications.

With the new hydraulic lift attachment, the Moto-Bug mast can be tilted 10 degrees toward the rear to assure better load balance, or 2 degrees forward to aid in picking up or releasing a load. Standard forks are 30 inches in length and adjustable from 6 to 32 inches in width. The S-10 has a rated lift capacity of 1,000 pounds at 15-inch load center, with maximum lift to a 6-foot height. Turning radius is 61 inches.

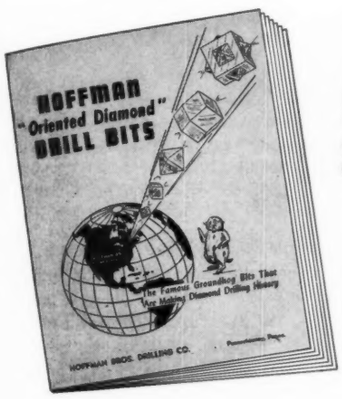
For further information write to the Kwik-Mix Co., 235 W. Grand Ave., Port Washington, Wis., or use the Request Card that is bound in at page 18. Circle No. 79.

The Model S-10 Moto-Bug with tilting mast, made by the Kwik-Mix Co., Port Washington, Wis.

Job-record pencil

■ Blueprints, contractors' records of men, materials, and equipment, and work progress reports kept in the field are made easier with a pen-pencil combination described in a folder from the Norma Pencil Corp. This four-in-one combination has black, red, and blue pencils and a pen, and contains an eraser and reserve leads.

To obtain this folder write to Norma Pencil Corp., 137 W. 14th St., New York 11, N. Y., or use the Request Card at page 18. Circle No. 96.



Find Out How HOFFMAN BITS Save You Money

Send for a copy of HOFFMAN'S new "Oriented Diamond" Drill Bit Catalogue

See how Hoffman Research is producing many other, almost unbelievable advancements in bit design like the Tapered "Step Core" and Miniature Bits shown here. The new Miniature Bits are reducing prospecting labor and costs because they operate from light, ¼ h.p. rigs. By combining drilling and reaming into one operation, the "Step Core" Bits penetrate faster—simplify core recovery—have high speed water release. Yes, it will pay you to find out why so many other drillers are getting better cores, lower footage costs and faster penetration with Hoffman "Oriented Diamond" Bits.

Hoffman Drilling Crews are also available for fast, efficient service on Contract Drilling Jobs.

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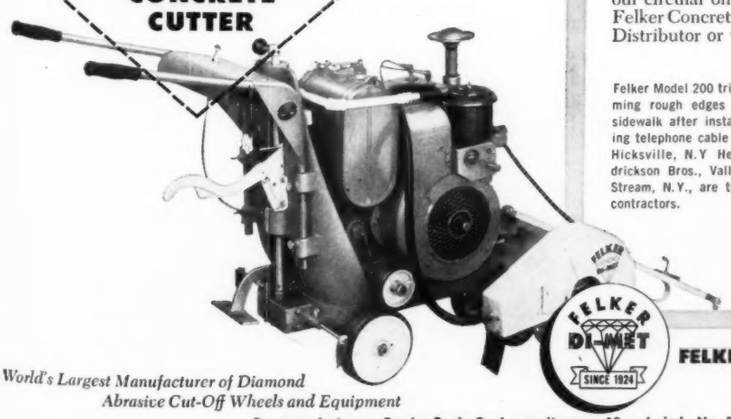
If you saw only 10,000 feet per year this pays for itself!

FELKER MODEL 200 CONCRETE CUTTER



World's Largest Manufacturer of Diamond Abrasive Cut-Off Wheels and Equipment

That's a fact! If you pay 15¢ to 18¢ per foot for concrete sawing—a common price for contract work, you can buy a Felker Model 200, equip it with Felker blades and cover labor costs on just 10 days' cutting per year! Check your next years' program—See how much you can save by ordering this low cost machine!

Felker Model 200 is an all-around machine, small enough for good maneuverability, husky enough for heavy production jobs. 13.5 h.p. Wisconsin, hydraulic lift and downfeed to blade. Get our circular on the Model 200 and other Felker Concrete Cutters from your Felker Distributor or write direct.

Felker Model 200 trimming rough edges of sidewalk after installing telephone cable in Hicksville, N.Y Hendrickson Bros., Valley Stream, N.Y., are the contractors.

FELKER MANUFACTURING CO.
Torrance, California

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THIS IS IT!

F/S MODEL 5172

HIGH PRECISION–
LOW COST–
NEW

AUTOMATIC LEVEL

Now you can get a reliable precision instrument which actually automatically levels itself, quickly, simply, easily—no complicated time-wasting adjustments . . . at an astonishingly low price!

● THE AUTOMATIC LEVEL F/S 5172 OFFERS YOU

24X Periscopic telescope containing a "pendulum-principle" device which automatically produces and maintains a horizontal line of sight.

Direct view of the spherical bubble through the telescope eyepiece, allowing constant check on the bubble centering while reading rod.

● THE AUTOMATIC LEVEL F/S 5172 GIVES YOU PRECISION ACCURACY

±0.028 ft./mile if used with regular base;

±0.010 ft./mile if used with special up-down movable base (micrometer Mod. 4180) graduated to 1/1,000 ft. or to 1/10 mm.

● THE AUTOMATIC LEVEL F/S 5172 COSTS YOU ONLY

$350 including adjustable leg tripod

$90 for the optional micrometer Mod. 4180

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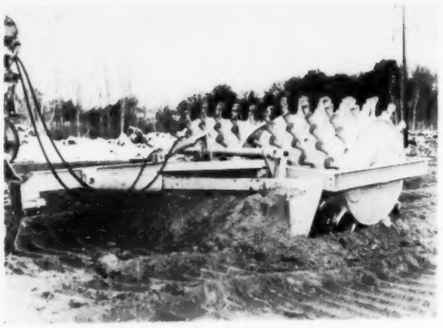


The new Bros level-blade attachment is mounted in front of the tamping roller.

New strike-off blade for tamping rollers

■ A level-blade attachment to fit Bros Series M2 tamping rollers, and soon to be available for the Series G2, has been announced by Wm. Bros Boiler & Mfg. Co. of Minneapolis.

The attachment is reported to do the work of dozers and graders, and to achieve more uniform compaction results. Mounted directly in front of the tamping roller, it levels off the high spots and fills in low spots on the road fill—resulting in even compaction over the entire area of the lift covered by the roller.

The blade has a 7½-inch vertical adjustment, controlled from the operator's seat, which permits it to be lowered to 5 inches below the drum surface. Raising and lowering movements are made by the tractor hydraulic system through simple takeoff connections, so they can be cable-controlled on tractors equipped with winches. An optional hydraulic system is available to supply hydraulic control independently.

Measuring 17 inches high by 112 inches wide, the blade has a ½×6-inch-carbon-steel reversible cutting edge, which is replaceable. The attachment replaces the towing tongue on present Bros rollers, and has a total weight of 1,750 pounds.

For further information write to Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 83.

New mounting eliminates parts and adjustments

■ A new method of attaching shovel-crane turntables to crawler or rubber-tire mountings has been announced by the Thew Shovel Co. It is claimed that the new Shear Ball mounting eliminates all need for top or hook-type turntable rollers, center pins and nuts, exposed roller paths,

Thew Shovel's new Shear Ball mounting for attaching shovel-crane turntables to crawler or rubber-tire carriers.

and centering gudgeons, along with the maintenance and adjustment usually associated with these items.

The Shear Ball mounting is at present standard equipment on two models of Lorain cranes, and is available as optional equipment on others in the line. Application of the new mounting is reported to result in more effortless swing with less power needed for swing operating, plus longer, trouble-free machine life and elimination of the need for periodic adjustments.

This mounting is described as being similar to a huge ball bearing. A continuous circle of hardened steel balls, sealed in a hardened precision-ground race, provides the means of attaching the turntable to the carrier or crawler, as well as the rolling surface for revolving the turntable.

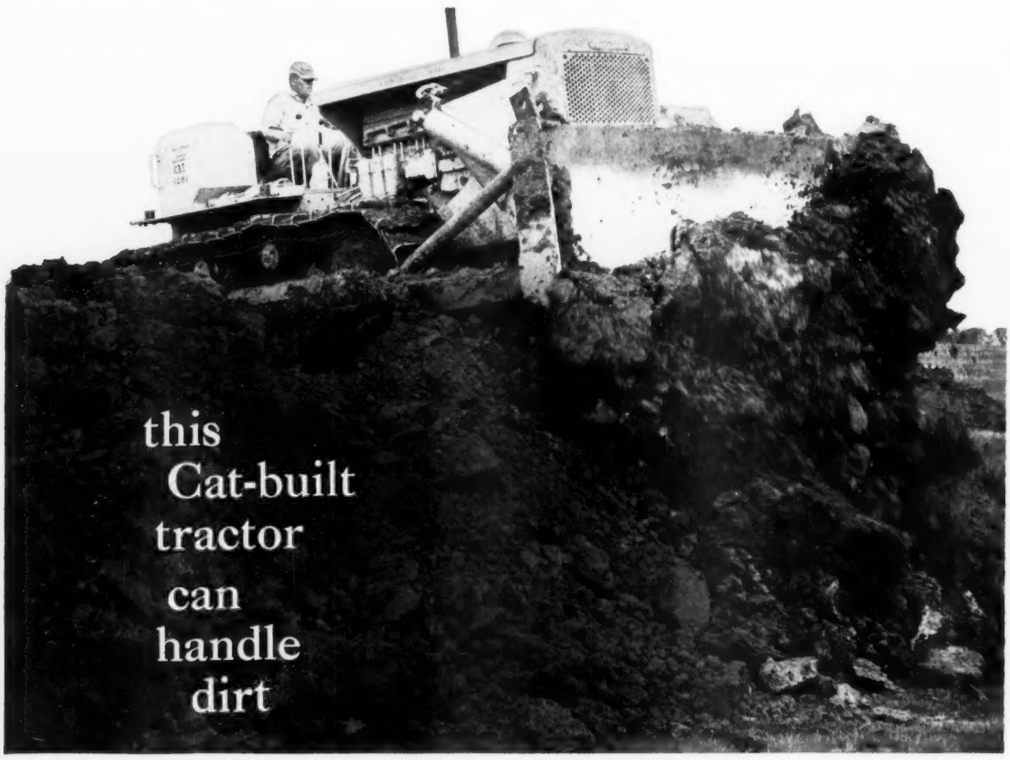
Normal lubrication is the only attention required, the company reports, and no adjustments or servicing are necessary.

For further information write to the Thew Shovel Co., 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 122.

Tandem-axle unit

■ A Hendrickson tandem-axle assembly, aligned with the frame by springs, keeps truck or other carrier wheels parallel to the frame and to each other, according to a catalog from Hendrickson Mfg. Co. A picture shows how the equalizing beam and antifriction ball-and-socket joints maintain positive alignment of the axles. Also pictured are the torque rod, below-axle load suspension, equalizer beam, and ball-and-socket joints. Complete specifications—unit models, rated capacity, axle spacing, tire size, and spring capacity—are listed.

To obtain this catalog write to Hendrickson Mfg. Co., 8001 W. 47th St., Lyons, Ill., or use the Request Card at page 18. Circle No. 19.



. . . with Caterpillar filter refills

Your Caterpillar dealer well knows the damage that dirt-laden oil can do to your tractor. Precision parts can be ruined in a matter of hours if unfiltered oil gets into the engine. That's why he always insists on giving you Caterpillar replacement filters. Built to meet the specific requirements of your engine by Purolator, they can handle all the volume your Cat-built tractor requires . . . they never let oil "by-pass" the filter . . . never let harmful abrasives enter the engine.

It's common sense to do as your Caterpillar dealer does . . . insist on Caterpillar filter refills. The life of your engine is at stake.

PUROLATOR

"FIRST IN THE FIELD OF FILTERING"

PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada
For more facts, use Reader-Reply Card opposite page 18 and circle No. 324

The new Blackhawk hydraulic pipe bender makes bends with only one setting of the pipe, one stroke of the ram.

Hydraulic pipe bender needs but one setting

■ Pipe bends up to 90 degrees can be made in one setting of the pipe and one stroke of the ram with the new S-130 One-Set hydraulic pipe bender introduced by Blackhawk Mfg. Co.

The S-130 has a bending frame, swivel, and bending shoes made of rigid, lightweight aluminum for greater portability, easier assembly, and maneuverability. A removable top plate permits easy setting of the shoes and positioning of the pipe for bending. The bender will work in any position—on the floor, on a table or overhead on existing runs.

Six cast-aluminum bending shoes handle ½, ¾, 1, 1¼, 1½, and 2-inch-diameter pipe or conduit. The shoes are simply set on the plunger and a lock pin dropped into place; no time-consuming threading of shoes on the ram is required. A remote-controlled hydraulic power unit gives the bender complete portability and versatility, and can be used separately as a maintenance jack. For big jobs, a motor-driven Blackhawk P-182 pump is available to speed work.

For further information write to Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 84.

Displacement caissons

■ The Franki Foundation Co.'s method of displacing caissons is detailed in a new catalog. The process whereby a heavy tube is pulled into the ground by blows from a drop hammer striking the concrete plug at the bottom of the tube is shown in step-by-step diagrams. Tables list the unit-load tons, column-load tons, and other pertinent data for two to seven caissons.

To obtain this catalog write to Franki Foundation Co., 103 Park Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 30.

Hough expands plant

A 55,000-square-foot addition to existing manufacturing facilities is now under construction by the Frank G. Hough Co., Libertyville, Ill. The new buildings, expected to be completed this year, will add a total of 368,000 square feet of manufacturing space to already-existing facilities.

The new plant will be devoted to the manufacture of Payloader tractor shovels.

the modern earth tamper...

THE JAY TAMPER

• No air compressors!
• No air hammers!
• No lines or hoses!

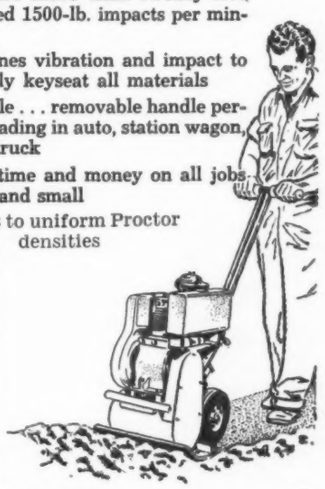
Weighs only 240 lbs.

Check these features:

- One-man operated
- One man will out-produce a 5-man air compressor crew.
- 8 full hours work on 2 gallons of gasoline
- Low investment . . . big production
- Vibrates and tamps all types of backfill
- Self-propelled . . . covers up to 75 feet per minute
- Delivers more than twenty-five hundred 1500-lb. impacts per minute
- Combines vibration and impact to properly keyseat all materials
- Portable . . . removable handle permits loading in auto, station wagon, small truck
- Saves time and money on all jobs — big and small
- Tamps to uniform Proctor densities

These . . . and many other contractors are now using the handy Jay Tamper—

The Austin Company	Hinkle and McCoy
Beaumont Bridge Company	Hunkin Conkey Construction Co.
C. F. Braun & Co.	The Texas Company
H. K. Ferguson Company	Texas Bitluthic Company



THE JAY Corporation
170 Hosack Street
Columbus 7, Ohio

Please send me additional information on the JAY TAMPER.

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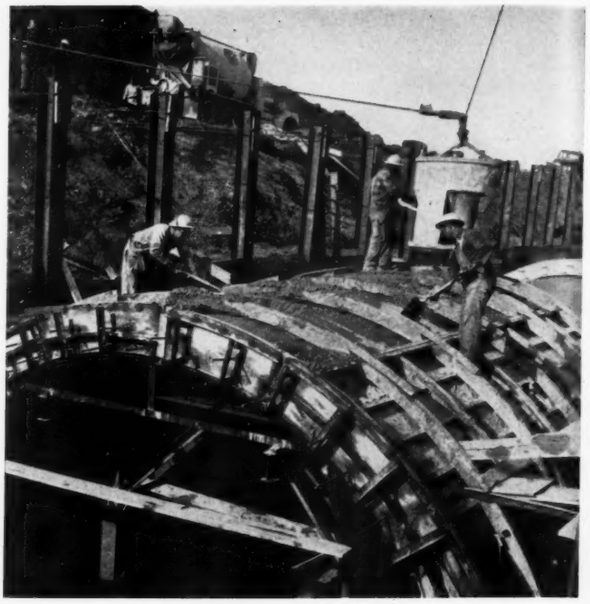
Concrete delivered by transit-mix truck goes into the crown of the 21-foot-diameter sewer. Continuous dewatering is required because of the high water table.
U. S. Army Corps of Engineers Photos



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Two independent, simultaneous priming actions . . . fast and doubly sure. • Oversize shells and impellers, engines of largest horsepower applicable. • The only positively lubricated shaft seal with ready inspection port. • Prime without racing, pump at slower speeds, pump more thousands of hours. Performance guaranteed. Sizes 1½″ to 10″. See your Jaeger dealer or send for Catalog P4.

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COMPRESSORS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS

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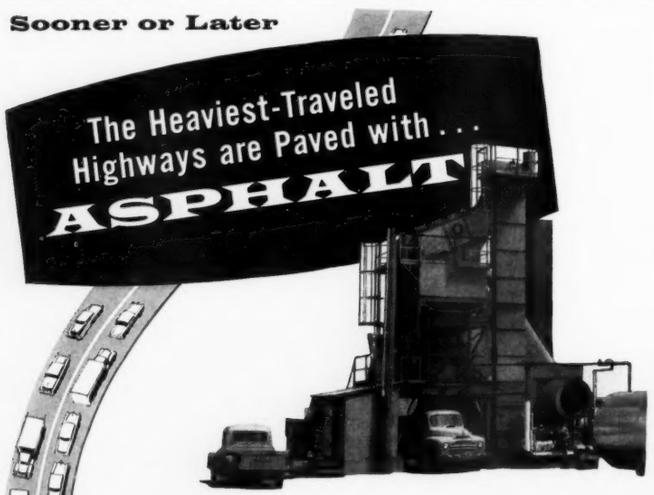
Big pressure sewer in Dallas forms part of floodway system

Though unwilling to share almost anything else, the rival cities of Dallas and Fort Worth are eagerly waiting the completion of reservoir and floodway projects that will control the upper reaches of the turbulent Trinity River and make the threat of floods nonexistent.

The floodway projects now being constructed at both cities augment the system of multipurpose reservoirs —already completed and in operation —and form part of the comprehensive plan for the use of water resources of the 700-mile-long stream.

At Fort Worth, where work is virtually complete, the project involves enlarging 58,400 feet of floodway channel on the Clear Fork and West Fork of the Trinity, and the rebuilding of adjacent levees. This project, started in 1950 at an estimated cost of $3,865,000 to the federal government, is being built with local interests furnishing lands and rights-of-way. When it begins to work with Benbrook Dam on Clear Fork, it will prevent a recurrence of floods like

Sooner or Later



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Busy, successful contractors prefer Cummer Asphalt Plants because they are batch-type. With Cummer Batch-Type Plants the mix is perfectly controlled throughout production.

Mr. J. H. Gallagher, President of the Corvallis Sand & Gravel Co., Corvallis, Oregon, owner of the 50-60 ton per hour capacity Cummer Asphalt Plant, shown above, has this to say: "We chose the Cummer Plant for its compactness and simplicity as well as the adequate strength capacity and standard design of all parts. Since each operation meshes in with the next, our Cummer Plant can be efficiently operated with a minimum of manpower."

Operating Cummer equipment is profitable business because Cummer Plants deliver maximum production with minimum downtime, low operating and maintenance costs and consistent quality.

The new illustrated, descriptive Cummer Catalog gives complete specifications of all models of plants, equipment and accessories. Write for your copy today.

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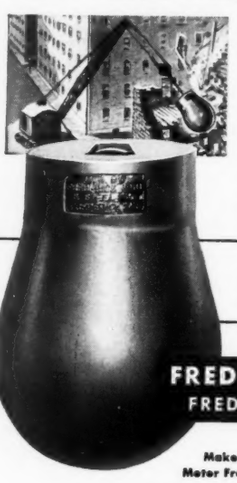
TRUE RUGGED POWER
that keeps costs down

Frederick
CAST semi-steel **DROP BALLS**



Get the wrecking power you want *exactly where you want it* with Frederick Drop Balls . . . tough, low cost production tools that stand up under constant punishment, with almost no maintenance. Extra durable nickel alloy is standard in all balls 4000 lbs. or over—or, we'll be glad to quote on special alloys if desired. Frederick's exclusive "Pear-shape" design drops straight—swings true —withstands greater impact . . . "E-Z Swing" steel eye is recessed to give cable protection plus free-swinging action. Balls can be furnished with replaceable pins, if requested. Also available are special release hooks for free dropping.

Wide range of sizes and weights:

Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.).. (for magnet use)	470	950	1650	2400	3000	3700	5400

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Makers of manhole frames, covers and steps • Storm Gratings Meter Frames and Covers • Centrifugal Pumps • Gray Iron Castings

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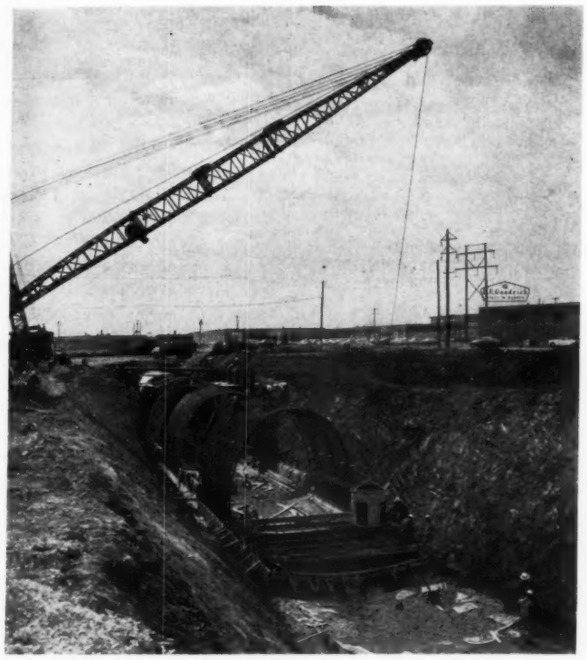
Collapsible steel forms support 25-foot-long pours; project includes work on levees and pumping plants



A Koehring crane buckets concrete to a pour for one of the 25-foot-long monolithic sections of the Turtle Creek pressure sewer. Collapsible steel forms are being used for the alternate pours.

those that took eleven lives and caused $11 million in property damage in 1949.

The $10,300,000 Dallas floodway project, started in 1953 and now about 50 per cent complete, involves strengthening about 23 miles of existing levees, together with improvements to interior drainage facilities. Within the levee system, near the confluence of the Elm and West Fork of the Trinity, are about 10,500 acres containing about 7,000 houses and 500 business establishments, including a power plant, the city's Union railroad station, and a huge warehouse. This is the area that will be protected by the floodway, which will operate in conjunction with the Benbrook Reservoir; the Grapevine Reservoir on Denton Creek, halfway between Fort Worth and Dallas; and Garza-Little Elm, on Elm Fork near Lewisville.

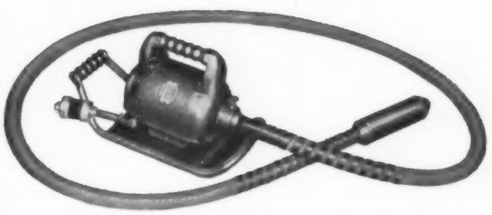
Pressure sewer biggest job

The largest phase of the Dallas work, now under construction, is the Turtle Creek pressure sewer, which will carry runoff from the Turtle Creek area into the river. A collecting basin will be built at the upper end of the horseshoe-shaped, 7,800-foot-long concrete sewer, and a gated outlet structure will be built at the lower end to control the release of water.

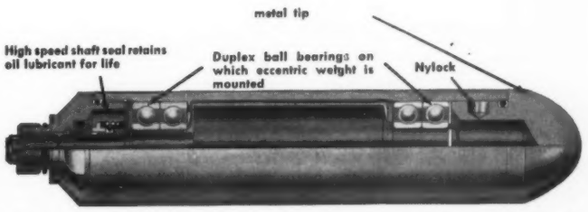
One section of this sewer has been completed by Whittle Contracting Co., Dallas, under a $507,737 contract. Parts 2, 3, and 4 are being built by a joint venture of McKenzie Construction Co. and Whittle Contracting Co., both of Dallas. These sections cost $359,717, $447,109, and $574,318, respectively. E. H. Reeder Construction Co., Dallas, is contractor for Section 5.

Trenches for the pressure sewer are being dug about 40 feet deep, with either shored or sloping banks, depending on soil conditions and the

In Concrete Vibrators, it's the WALLOP that counts!



"Wallop", which is what many contractors call amplitude, is what it takes to vibrate a stiff mix—quickly and thoroughly. Recent tests prove that the efficiency of vibration increases in proportion to the amplitude. Therefore, Stow Manufacturing Co., Binghamton, N. Y., has developed a lightweight, rugged electric vibrator that packs a *terrific* wallop. This wallop is achieved by the unique vibrator head, shown below, driven by a powerful 2 HP motor which delivers 9000 vibrations per minute to the mix.


metal tip
High speed shaft seal retains oil lubricant for life
Duplex ball bearings on which eccentric weight is mounted
Nylock

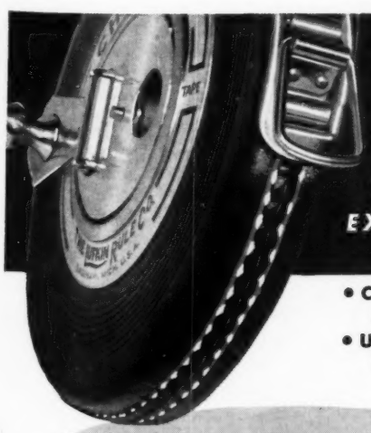
Take a look at this vibrator head. It is 10 inches long, and available in diameters of 1⅜, 2 and 2½ inches, capable of 9000 VPM. Vibrations are achieved by use of an eccentric weight mounted in special high speed duplex ball bearings at each end. The outside of the head is case hardened, for extra long wear, and it has a replaceable tool steel tip. STOW estimates that these two improvements alone will double the life of the heads.

Construction men report that they like the light weight, the long life, the low replacement cost, and the terrific wallop of these heads. Weight of the 1⅜" head is about 5 lbs.; the 2" head, about 7½ lbs.; the 2½" head, about 9 lbs. The cost of this head is less than ⅓ the cost of expensive motor-built-in type heads.

For more information about the complete line of STOW concrete electric and gasoline vibrators, vibrating screeds and rotary trowels, contact your STOW distributor, or write for STOW Catalog 560!

STOW MANUFACTURING CO.
40 Shear St., Binghamton, New York

For more facts, use Reader-Reply Card opposite page 18 and circle No. 330



WHY Hand-Stitched Leather Covers Give EXTRA LONG WEAR

- CLOSER STITCHING HOLDS TIGHTER
- UNIFORM STRESS PREVENTS TEARING

LUFKIN CHROME CLAD ANCHOR STEEL TAPES

The everlasting choice in long steel tapes! Handsome, top-quality, leather case is hand-stitched over rust-resisting metal liner. Hand-stitching ensures a better, longer wearing outside cover. Exclusive Chrome Clad line is rust and corrosion resistant — will not chip, crack or peel. Bold black markings can't wear off. 25 - 50 - 75 - 100 foot lengths.

BUY LUFKIN TAPES • RULES PRECISION TOOLS FROM YOUR SUPPLY STORE

THE LUFKIN RULE COMPANY
SAGINAW, MICHIGAN

400 BETTER MEASURE WITH LUFKIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 329

(Continued from preceding page)

Old levees near the city, originally built in the 1920's by local interests, are being strengthened by the Corps of Engineers as part of the over-all project. A Cat D6 here pulls a sheepsfoot roller to compact material on the levee system.
U. S. Army Corps of Engineers Photo

facilities located on adjacent ground. Material not needed for backfill is being moved to spoil areas, one of which is the abandoned Trinity River channel. Since the water table is high, continuous dewatering has been necessary in the work areas.

The concrete barrel of the new pressure sewer is being constructed of 25-foot-long monolithic units, poured alternately, in collapsible steel forms. The reinforcing steel being used varies in size up to 1¼ inches.

Transit-mix, obtained from a nearby plant and placed in the forms, is being consolidated by high-frequency vibrators. After the crown of the barrel has been hand finished, the concrete is given an application of a membrane curing compound. Where the line crosses the levee, concrete collars and rubber water seals are being installed at construction joints to make the sewer watertight.

Wooden forms are being used for invert pours and for a V-shaped dip in section 2, where the sewer crosses a 72-inch sanitary concrete sewer that cannot be taken out of service or relocated. The project is being built without interrupting services or facilities, even in section 4, where it runs beneath three railroads and Harry Hines Boulevard, a busy four-lane main thoroughfare.

Much work completed

Aside from work on the pressure sewer, construction is under way on the Hampton Road pumping plant and improvements to additional portions of the west levees and the Coombs Creek diversion facilities.

Cleal T. Watts, Rochdale, Miss., is using ten 16-yard Euclids, Caterpillar D6 tractors with sheepsfoot rollers, and Caterpillar D8's with dozers for the levee work. Excavation is being handled by dragline for this $832,161 phase of the over-all project. The Hampton Road pumping plant is being built under a $701,816 contract by Whittle Construction Co.

Another pressure sewer, involving construction of a 3,100-foot-long 7-foot diameter storm sewer from Lake Cliff to the river, was completed recently by the McKenzie and Whittle firms at a cost of $419,622.

Other completed work includes an addition to Pumping plant "A", which will provide eight times the pumping capacity previously available. This plant houses three electric pumps with a combined capacity of 140,000 gpm. A similar plant has also been completed at Pavaho Street.

All this work on the Dallas floodwater project is under the direction of Col. Harry O. Fischer, Fort Worth District Engineer for the Corps of Engineers. Laurence W. Davis is project engineer for the Corps. . THE END

Poeter succeeds Gates as Vermont highway head

The Department of Highways of the State of Vermont has appointed William Poeter to succeed Paul H. Gates as state highway commissioner. Mr. Poeter took office this month.

30 Dependable Sources of Emulsified Asphalt

McCONNAUGHAY LICENSEES
Operating K. E. McConnaughay Emulsified Asphalt Plants

1. Doherty and Swearingen Co. 53 Main St., *Yarmouth, Maine*
2. Berkshire Asphalt Co., Inc. 620 Berkshire Ave., *Springfield, Mass.*
3. James Huggins & Sons, Inc. Medford & Commercial Sts. *Malden 48, Massachusetts*
4. C. C. Plumb, Elmwood Station P. O. Box 65, *Providence 7, R. I.*
5. C. C. Plumb *Portland, Connecticut*
6. Albany Asphalt & Aggregates 75 State St., *Albany, New York*
7. Knight Paving Products, Inc. 1655 Union Rd., *Gardenville, N. Y.*
8. Knight Paving Products, Inc. Vine Street, *Ithaca, New York*
9. Knight Paving Products, Inc. 1980 East Ave., *Rochester 10, N. Y.*
10. Knight-Bitumen Corp. *Watertown, New York*
11. Seaco, Incorporated 2700 Industrial Drive, *Columbia, S. C.*
12. E. A. Mariani—Emulsified Asphalt Hooker's Point, *Tampa, Florida*
13. Pan-Am Southern Corporation P. O. Box 2, *New Orleans 6, La.* (Also serving Alabama and Mississippi)
14. Asphalt Products Co., Inc. Powell Ave., *Nashville 11, Tenn.*
15. Bituminous Materials Co. P. O. Box 267, *Terre Haute, Ind.*
16. Wabash Valley Asphalt Co. *Terre Haute, Indiana*
17. Brookman Construction Co. 17th & Gharkey Sts., *Muncie, Ind.*
18. Fauber Construction Co. *Lafayette, Indiana*
19. Asphalt Materials & Construction, Inc. 960 E. 22nd, *Indianapolis 2, Ind.*
20. Ready-Mix Asphalt, Inc. P. O. Box 882, *Fort Wayne 6, Ind.*
21. Walsh & Ikeler R. R. #2, *Gary, Indiana*
22. Bituminous Materials Co. 416 S. Water St., *Jackson, Mich.*
23. Bituminous Materials Co. 318 Atlantic St., *Bay City, Mich.*
24. Emulsions, Inc. *Lawrenceville, Illinois*
25. Bituminous Materials & Supply Co. 415 Maple St., *West Des Moines, Iowa*
    Plants:
26. *Spirit Lake, Iowa*
27. *Iowa City, Iowa*
28. *Menlo, Iowa*
29. Emulsified Asphalt Co. *Kuttawa, Kentucky*
30. Bituminous Materials Co. *Escanaba, Michigan*

Eastern Representative:
John A. Dow
157 Church St., *New Haven 10, Conn.*

From Maine to the Gulf... from the Atlantic to Iowa... you can be sure of fast, dependable service on asphalt emulsions and mixes by calling any of the McConnaughay Licensees listed at right. This co-ordinated group, guided by a central organization, is made up of experienced manufacturers and contractors who fully understand your problems, offer extensive engineering and testing services on paving materials and mixtures as well as on-the-job advice. Fully equipped to take on complete contracts or provide the laboratory facilities, emulsions and technical services required... they are always ready to work with you closely in solving your problems. Take advantage of this exceptional service. If you are figuring on highway, street, or general paving, get in touch with your nearest McConnaughay Licensee or contact...

K. E. McCONNAUGHAY
EMULSIFIED ASPHALT
Plants and Processes
LAFAYETTE, INDIANA

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

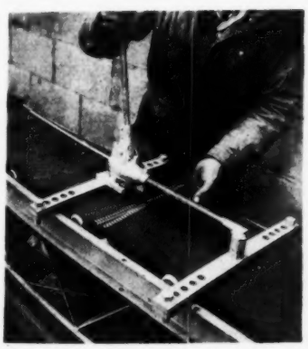
1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching, 11—Mastic-Mix, 12—Driveway Construction.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 331

INCREASING TRAFFIC over the Passaic River between Newark and Harrison, N. J., forced county officials recently to recondition the old Bridge St. bridge that had been out of service several years. Under a $350,000 contract, Peerless Construction Co., White Plains, N. Y., replaced the mechanism that moves the swing span. The contractor jacked up the steel superstructure of the span onto temporary 55-foot timber piles, removed the old mechanism that no longer operated, and installed new machinery in the pivot pier. Rubble on barge (right) was cut out of deck to permit the driving of pile jacking bents directly under the structure. Part of the pier was also cut down to make room for the new and larger 100-ton mechanism (above) that was assembled and tested at the Baldwin-Lima-Hamilton Co. plant, Eddystone, Pa.

Stretchers for belts up to 36 inches wide

■ Two belt stretchers, the larger one for installing conveyor belts up to 36 inches in width, are announced by the Farnco Sales Co. The Model LS-1 Far-Pul belt stretcher will take a width up to 16 inches and utilizes one



The Model LS-1 Far-Pul belt stretcher.

tightening jack, while the Model LS-2 uses two jacks for wider belts. Both models have a take-up of 22 inches.

The swivel action of the arms keeps the belt in perfect alignment, even though the gripping arms may not be parallel to the belt edges. Threaded holes in the bottom of the bars permit easy removal of nuts when the belt is drawn tight.

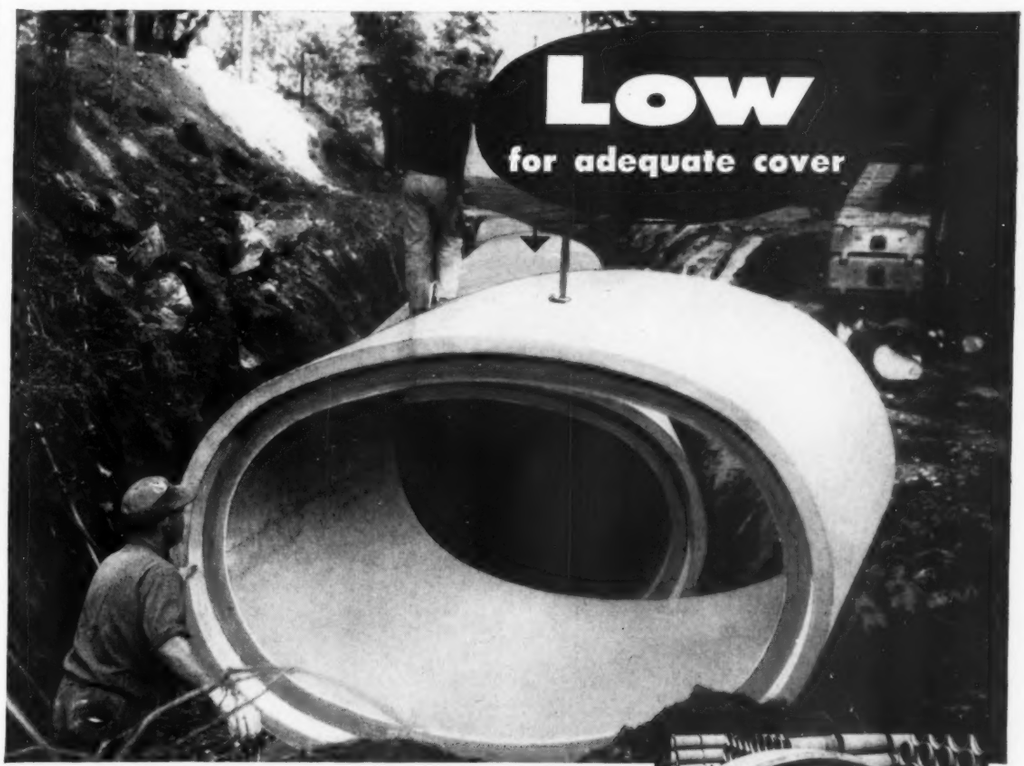
The bars grip the belt without damaging it in any way, according to the manufacturer. Either model is easily operated by one man, and can be stored compactly. The single-jack model weighs 24 pounds, while the larger model weighs 48 pounds.

For further information write to the Farnco Sales Co., P. O. Box 5796, Pittsburgh 8, Pa., or use the Request Card at page 18. Circle No. 94.

Sonneborn opens new plant

Equipment to speed production and deliveries to West Coast customers has been installed by L. Sonneborn Sons, Inc., New York, N. Y., in a new plant in Los Angeles, Calif. Located at 4821 S. Vermont Avenue, the new facility will serve as a production and sales center for Sonneborn's line of cement admixtures, air-entraining agents, and curing compounds.

Otto Bachrach will head the new branch.



LO-HED Reinforced Concrete Pipe for Culverts and Sewers

Greater Capacity . . . Faster, Easier Installation . . . Less Cost!

Elliptical LO-HED Pipe carries a greater flow than its round equivalent—in a minimum depth of cut with increased depth of cover. LO-HED Pipe is easier to lay, to grade and line. Smooth walls and tight joints insure maximum hydraulic capacity, with a minimum build-up of debris in the invert, even under low-flow conditions. Furnished in pre-tested strengths to answer any low headroom problem, including culverts under highways and railroads.

Write today for specifications on time and money-saving LO-HED Reinforced Concrete Pipe.

A full range of sizes in LO-HED Pipe is available for nearly all culvert and drainage installations.

New brochure available containing hydraulic characteristics and discharge diagrams for all sizes. Write today for your free copy.

A-M

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CONCRETE PRODUCTS DIVISION
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Concrete Conduit Company | Lamar Pipe and Tile Company | Universal Concrete Pipe Co.
Tellyer Concrete Pipe Co. | American-Marietta Company of Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 332

The concrete-gunning technique is used to construct a 20 x 40-foot pool at a resort lodge in Tucson, Ariz. The job is being done with a portable Airplaco rig, background.

Boom in swimming pool work benefits smaller contractors

Gunned concrete cuts time, cost of construction; estimated $325 million to be spent on pools in 1956

A rapidly growing field for the small contractor—a field in which at least $325 million will be spent this year alone—is in the construction of swimming pools for homes, motels, clubs, and schools throughout the U. S.

Typifying this booming type of work is the pool built recently for a resort lodge in Tucson, Ariz., by Whitaker Construction Co. Whitaker, a franchised contractor for Fiesta pools, built a 20×40-foot pool with air-placed or gunned concrete, using an Airplaco portable gunning rig containing an Airplaco Nucretor, Mix-Elvator, and Sand Loader made by Air Placement Equipment Co., Kansas City, Mo.

Though the pool built by Whitaker is rectangular in shape, a pool of virtually any shape or design can be built at low cost with gunned concrete. Since forming is not required, time consuming carpenter work is unnecessary. This of course, saves the contractor in time, in labor, and in materials.

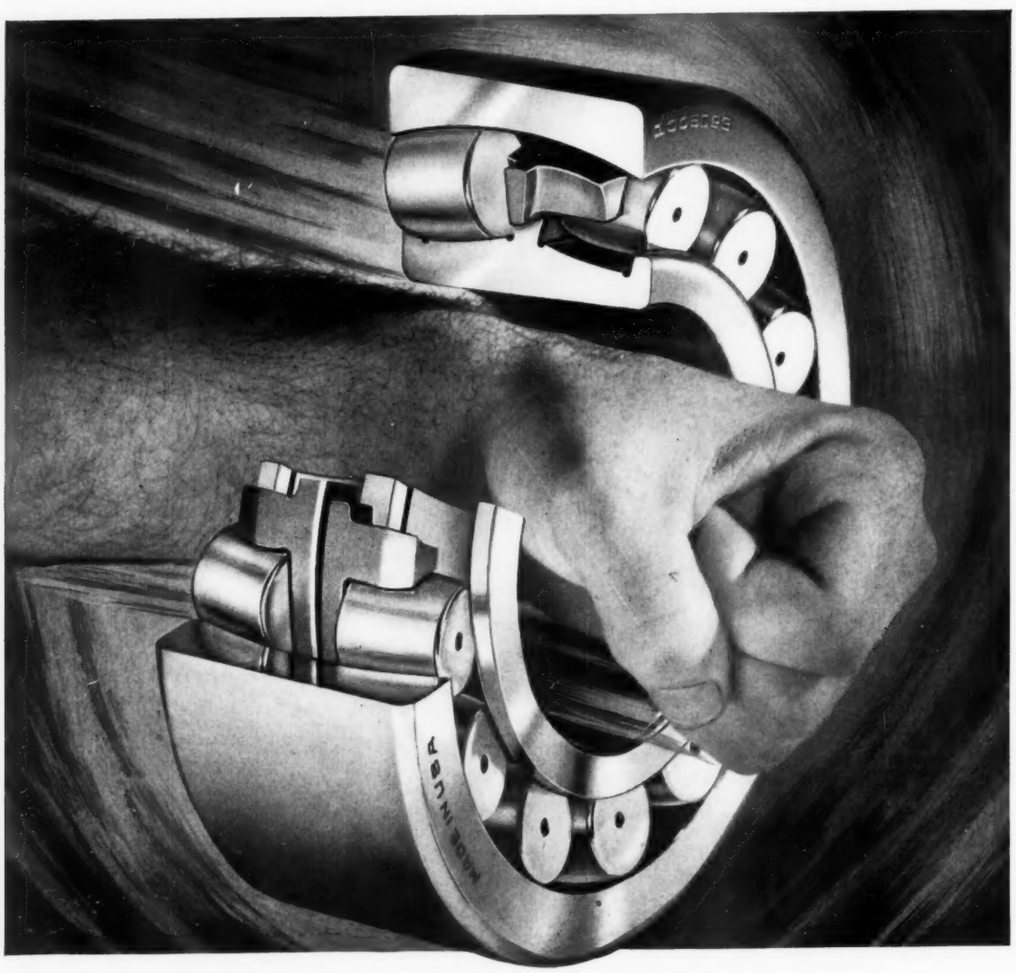
Excavation is simple

Excavation for a gunned concrete pool can be simply handled by either a backhoe or front-end loader. Since forms are not required, excavation has to be carried only to the finished dimensions of the pool. Backfilling is also unnecessary. Once earthmoving equipment has finished work, the excavation is smoothed out and shaped to conform to the design plant.

Reinforcing steel is then laid over the bottom of the pool and up the sides of the excavation to the bond beam. Before concrete gunning starts, plumbing for the water inlet, the surface skimmers, the main drain, and miscellaneous piping is roughed in. If underwater lighting is desired, wiring and waterproof connections can be completed before the concrete shell of the pool is constructed.

With this done, concrete is gunned to the desired thickness over reinforcing steel to form the shell and contour of the pool. If the pool has an unusual shape, a few simple guide forms around the top edges of the pool will help the nozzle operator shape the bond beam. Since air concrete is extremely dense and since it sets up quickly due to its low water ratio, there is no slumping or sagging

TORRINGTON *SPHERICAL ROLLER* BEARINGS



This bearing can take thrust, too!

Design is the secret. TORRINGTON Spherical Roller Bearings are made with an integral center flange on the inner race. This assures *positive radial stability and accurate positioning of rollers* wherever high radial load and heavy thrust are encountered under conditions of misalignment.

From crushers to cranes, power shovels to pulverizers, you get long, maintenance-free operation, better performance in your equipment, more value from your bearing dollar when you specify these rugged dependable bearings.

Prove to yourself that TORRINGTON design does make a difference. Next time specify TORRINGTON Spherical Roller Bearings. They're available with either straight or tapered bore, for shaft or adapter mounting.

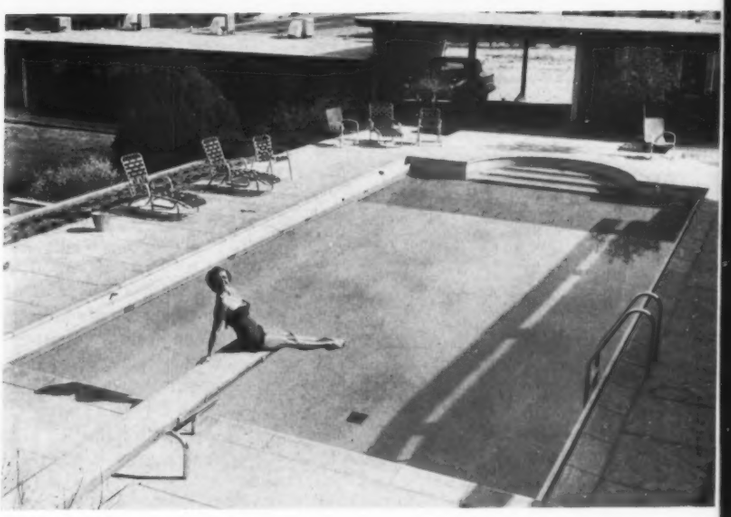
THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District offices and distributors in principal cities of United States and Canada

90th ANNIVERSARY 1868–1958

TORRINGTON BEARINGS
Spherical Roller • Tapered Roller • Cylindrical Roller
Needle • Ball • Needle Rollers

For more facts, use Reader-Reply Card opposite page 18 and circle No. 333

No slumping or sagging takes place as concrete is shot onto the sides of the pool. Though no concrete forms are required, wooden guide forms are used to shape the bond beams.



This pool, built with air-placed concrete, is rectangular in form, but virtually any shape of pool can be built easily and at low cost with the concrete-gunning method.

problem to contend with.

Freshly shot concrete is screeded or trimmed to conform with the exact shape of the pool. This can be done easily, since the air-placed concrete is soft enough to be scraped yet hard enough to support the weight of the workmen without damaging the surface. A straight and true finished surface facilitates the application of a smooth finished plaster coat.

As soon as this work is completed, the precast coping is placed around the edge of the pool. This coping is available in various shapes, lengths, and colors. One row of tile is then set just below the coping and at the water line. With this done, the pool is left to cure for about three or four days before a thin plaster finish coat is applied to the shell. This coat is usually a blend of white portland-cement concrete and white marble dust. Coloring can be added to the finish if desired.

Plumbing, filtering, and electrical equipment can then be installed, together with ladders, diving boards, and miscellaneous equipment. Flagstone, terrazzo, colored concrete, or virtually any other type of material can be used to build an apron or decking for the pool.

THE END

Lubrication equipment

■ A complete portable power lubrication unit for construction field service highlights a catalog from Alemite. The air compressor is usually mounted behind the cab. Barrel pumps handle the pressure gun lubricants, gear lubricants, and motor oils. Finally, the hose reels are added to hold the various types of hose and control valves needed. Diagrams and specifications are included.

To obtain this catalog write to Alemite Division, Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill., or use the Request Card at page 18. Circle No. 152.

Colorado Fuel & Iron moves district office

The Colorado Fuel & Iron Corp., New York, N. Y., has moved its Chicago district sales office and warehouse to larger facilities at 3838 W. 51st St., Chicago 32, Ill. The office is managed by L. J. Renner.

NOW! the steam cleaner you have been waiting for...

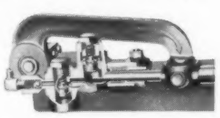
the **ALL NEW**

"Twelve Fifty" Series

HYPRESSURE **Jenny**

Your Jenny Distributor offers it on easy terms, with trade-in allowance for your old steam cleaner.

You'll be glad you waited for the ALL NEW "Twelve Fifty" Series Hypressure Jenny to modernize your steam cleaning operation, because it has many features that guarantee faster and more effective cleaning at lower cost. Here are but a few of "Twelve Fifty's" advantages:



- Quiet, slow-speed, short-stroke pump; less wear; longer life; disc check valves—no adjustments; delivers a full 120 gallons per hour *at any pressure.*
- Instant starting—instant steaming. Full cleaning power in less than a minute!
- Sturdy compact design. Never before has Hypressure Jenny packed so much cleaning power into such small space.
- Hinged machinery cover affords easy and complete access to all working parts.
- Remote control—automatically shuts off pump and burner when operator closes valve on cleaning gun —saves time, fuel, compound, water and electricity.
- Cleaning power booster—stirs and preheats solution.
- Hose rack on cover, and rubber-tired wheels make it easy and convenient to take a new "Twelve Fifty" to the cleaning job.

Get full particulars on the best "Twelve Fifty" Model for your needs. Mail the coupon now. No obligation.

HYPRESSURE JENNY DIVISION

HOMESTEAD

VALVE MANUFACTURING COMPANY

"Serving Since 1892"

P.O. BOX 30 CORAOPOLIS, PA.

Send full particulars on the ALL NEW "Twelve Fifty" Series Hypressure JENNY.

I am interested in: ☐ Jobber Time Payment Plan ☐ Trade-in Allowance

Name_____ Title_____

Company_____

Address_____

City_____ State_____

For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 334

New engine features short-stroke pistons

■ A new short-stroke air-cooled gasoline engine designed for construction and other heavy-duty applications, is announced by the Kohler Co.

The K330 is a single-cylinder, four-cycle engine equipped with flyweight governor, oil-bath air cleaner, and silencer-type muffler. It delivers 12.5 hp at 3,200 rpm; weighs 175 pounds.

Its short stroke is claimed to reduce friction by more than 30 per cent and increase piston life by more than 50 per cent. The cooling system is said to maintain correct temperatures in the engine under all operating conditions and in a wide range of locations.

The K330 will also be made available in a number of optional models that will include direct-mounting crankcase, reduction gear, hand clutch, and electric starter and generator.

For further information write to the Kohler Co., Kohler, Wis., or use the Request Card at page 18. Circle No. 136.

The Hy-Deck aerial platform is hydraulically operated.

Elevating work platform mounts on trucks

■ A new, portable elevating work platform, the Hy-Deck, which converts any size or type of truck for aerial work up to 37 feet, has been announced by the G. W. Galloway Co. The hydraulic platform lift reportedly raises 500 pounds to full height in less than 2 minutes. It is available with electric motor, gasoline engine, or power takeoff. The work platform can be raised and lowered by means of foot controls on the platform floor, or by hand controls mounted on the truck body.

The twelve different sizes and styles of platforms obtainable fulfill a wide variety of specialized uses. They are equipped with a collapsible aluminum guard railing which can be folded when the platform is down, making the entire assembly only slightly higher than the truck cab.

For further information write to G. W. Galloway Co., 25 N. Fourth Ave., Arcadia, Calif., or use the Request Card at page 18. Circle No. 143.

Product literature

■ A new directory of product literature gives a complete alphabetical listing of Allis-Chalmers equipment and catalog numbers of descriptive literature. According to the directory, operating data, construction details, and technical information are contained in each piece of literature. The products of the A-C Tractor Group are listed separately, as well as the firm's sales and branch offices.

To obtain Directory B6057 write to Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 38.

Shock-absorbing lamp

■ Floodlamps mounted on cranes, draglines, pile drivers, and similar equipment are said to give longer service with the new Circle D vibration shock mount, according to a bulletin from the manufacturer, Natale Machine & Tool Co. The unit protects lamps in two ways: a shock-absorbing spring socket and silicone-cushion gasket support the lamp, and a new steel-enclosed shock mount with neoprene supports insulates the whole unit against vibration.

To obtain this bulletin write to Natale Machine & Tool Co., 339 Route 17, Carlstadt, N. J., or use the Request Card that is bound in at page 18. Circle No. 74.

"We dig between 175 and 200 basements a year, so I sure like this new 2¼-yd Allis-Chalmers HD-11G.

It handles just like a kitten"

George Pfeiffer, *Crystal Lake, Illinois*

Excavating basements, loading out trucks and landscaping work keep George Pfeiffer busy the year 'round. Like all contractors, big or small, he tries to make every hour count.

"I like everything about our 11G, including its over-all speed and reach. We can heap big truck loads fast and easy.

"When we bought this Allis-Chalmers HD-11G, we didn't figure on using it in close around homes, but we've found that it handles just like a kitten. It responds so quickly that we're using it just like our 1-yd Allis-Chalmers tractor shovel."

• • •

To get high production on fast-moving job assignments, at a profit, more and more contractors are choosing the new HD-11G. It's a truly modern tractor shovel, with all the advantages of Allis-Chalmers advanced basic design, including an all-steel box-A main frame; one-piece steering clutch and final drive assembly; 24-volt direct electric starting; unit construction; and 1,000-hour lubrication intervals for truck wheels, support rollers and final drives.

What's more, the HD-11G has what it takes for big, tough jobs — 105 net engine horsepower; 2¼-yd bucket capacity; 11-ft, 7-in. dumping height; 32,000 lb of balanced weight; almost 9 ft of track on the ground; 8 heavy-duty truck wheels per side; long-wearing ceramic master clutch lining; and a constant mesh transmission that eliminates double shifting.

All in all, the Allis-Chalmers HD-11G is tops as a tractor shovel. Let your Allis-Chalmers dealer prove it to you in a demonstration. It will be well worth your while.

ALLIS-CHALMERS
CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 335

The new Red Seal hydraulic coupling.

New hydraulic coupling has high power factor

■ Overload protection, high power factor, and smooth positive acceleration are features claimed for the new Red Seal hydraulic coupling just announced by Continental Motors Corp.

The new coupling is designed to transmit horsepower and torque through a fluid, thereby improving performance characteristics and cushioning both engine and equipment from shocks of sudden load applications.

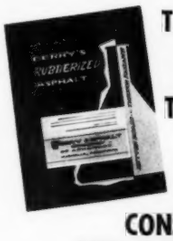
According to the manufacturer, the new unit was developed for use on compressors, conveyors, blowers, cranes, crushers, pumps, winches, road equipment, and other heavy machinery.

For further information write to Continental Motors Corp., 205 Market St., Muskegon, Mich., or use the Request Card at page 18. Circle No. 56.

Clark names manager of labor relations

A new labor relations manager, Richard J. Donnelly, has been appointed by the Clark Equipment Co., Buchanan, Mich. A graduate of Western Reserve University, Cleveland, Ohio, with a degree in industrial management, Mr. Donnelly was formerly associated with General Motors Corp.

BERRY'S *RUBBERIZED* **ASPHALT**



THIS FOLDER CAN SAVE YOU THOUSANDS OF DOLLARS IN ROAD CONSTRUCTION AND MAINTENANCE

You will see how rubber and asphalt have been successfully blended to form an all weather sealcoat — how the adhesiveness and resiliency of rubber have been retained in the exclusive Berry blending process — why Berry's rubberized asphalt is less susceptible to temperature, holds more aggregate, saves on bitumen and requires far less maintenance.

Write for your copy today.

BERRY ASPHALT COMPANY OF ARKANSAS
P. O. Box 800 Magnolia, Arkansas
MEMBER OF THE ASPHALT INSTITUTE

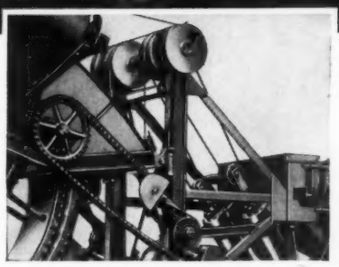
For more facts, circle No. 336

THE FIRST INDUSTRIAL construction to employ Hasko-Struct, a sandwich panel type of curtain wall with both exterior and interior faces of polyester resin-laminated glass cloth and built-in expanded polystyrene resin insulation, has been completed for the Burke E. Porter Machinery Co., Grand Rapids, Mich. Panels were joined together with splines of 4½-pound-density expanded polystyrene inserted in the panel edge joints to provide air-tight and water-tight joints. No mastic or adhesive was employed; only slight pressure was required to position the spline in the precut edges of the panel. For further information write to **Haskelite Mfg. Corp.**, Grand Rapids 2, Mich., or use the Request Card at page 18. Circle No. 141.

NOW! Instant Hydraulic Control of Conveyor Speed and Direction Only Gar Wood Buckeye has it!

Live hydraulics in new job-proved Buckeye ditchers make conveyor control far easier and faster than ever before. From the seat, the operator merely touches a lever for instant conveyor adjustment to handle any volume of spoil. Three discharge speeds in either direction meet every conveyor need. And, Gar Wood's exclusive hydraulic conveyor drive is completely independent of any other function. No complicated shifting . . . no need to stop digging wheel or crawlers. Maintenance is easier, too. No complicated drive transmission to adjust and repair.

All three of these new Gar Wood-Buckeye models—the 305, 307 and 308—have this and many other important features. For complete data and specifications, call your Gar Wood-Buckeye dealer or write direct to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.



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Positions digging wheel faster, more accurately. Independent of all other operations. Operated from the seat by simple, one-hand controls.

GAR WOOD INDUSTRIES, INC.
Wayne, Michigan • Findlay, Ohio
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.

Gar Wood Excavators | Gar Wood Tractor Equipment | Gar Wood Winches | Gar Wood-Buckeye Finegraders | Gar Wood-Buckeye Ditchers | Gar Wood-St. Paul Hoists & Bodies

For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

KONKURE Concrete Curing Compounds

Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications.

Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures* or rainfall damage.

*In hot, dry areas, use of Konkure White is especially recommended.

GENERAL PURPOSE

KONKURE Clear — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

KONKURE White — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

KONKURE Black — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

KONKURE Gray — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.

TILT-UP and LIFT-SLAB

KONKURE P. C. C. — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Write or Phone for Full Information

KONKURE COMPANY

6742 Stanton Avenue, Buena Park, California • Phone: LAwrence 2-2841

For more facts, use Reader-Reply Card opposite page 18 and circle No. 338

Here's how to CUT DOWN-TIME with OTC hydraulic power units

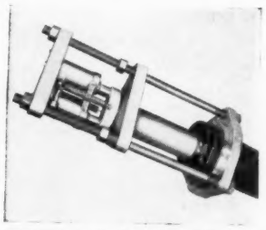
Portable Pulling and Installing Units Save Time on Thousands of Jobs in Shop or Field

One of hundreds of jobs done easier and faster with OTC hydraulic pulling units. Here a 50 ton Power Twin unit is removing a crawler tractor sprocket.

OTC tools save time because they go to work fast—they fit the work and one man can set the pulling units in position in minutes. Then the powerful ram goes to work saving hours and sometimes days in repairing all types of field equipment.

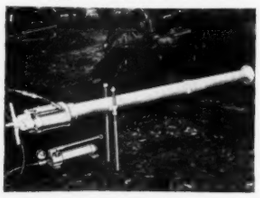
OTC famous hydraulic tools offer up to 100 tons of power to instantly pull or install parts without distortion or breakage. For more than 20 years OTC tool designers have worked with factory service engineers building these tools to speed maintenance in shop or field. Sets are available for all makes of tractors and other equipment.

Whatever your special problem, let us help you. OTC manufactures the most complete line of pulling tools available. Start now to save time and money. Get acquainted with OTC.



OTC 50 ton unit—the only tool that can remove and install International TD 24 track and accumulator spring in the field.

OTC 100 ton Power Twin hydraulic unit removing pivot shaft from a TD 18 tractor.



SEND FOR NEW FREE HYDRAULIC BOOKLET

OWATONNA TOOL COMPANY

381 CEDAR STREET OWATONNA, MINNESOTA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 339

A Manitowoc 3000 B Special 50-ton crane, operating over timber planks that protect the pavement, prepares to lift a girder from the trucks with its 95-foot boom. A guy derrick on the second floor of the building will slip a bridle around the girder after it has been lifted a few feet.

Huge girders in welded buildi

Stock exchange trading floor to occupy unobstructed area; narrow streets complicate handling of 54 to 79-foot girders

Some of the longest single-span plate girders ever used in a New York City skyscraper—54 to 79 feet long and 12 feet deep—are being erected on the fifth floor of a new building in the financial district. A total of 18 girders will make it possible for steel columns to be removed from the two stories below, leaving an unobstructed area that will eventually become the expanded trading floor of the adjacent New York Stock Exchange.

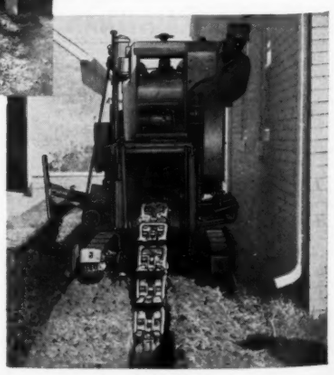
The erection job on the 27-story office building at 20 Broad Street can be done only on Saturdays and Sundays, when the 20-foot wide streets in this old section of the city are clear of traffic. Altogether, 5,700 tons of structural steel are being supplied for the $15 million structure by Lehigh Structural Steel Co., Allentown, Pa., under a subcontract from George A. Fuller Co., New York, N. Y., the general contractor. Lehigh Construction Co., Inc., a subsidiary of Lehigh Structural Steel, is handling steel erection.

The huge girders are being lifted into their fifth floor slot by an American guy derrick, equipped with a 100-foot mast and 90-foot boom, that is mounted on the second floor. At first-floor level is a Clyde Frame 6 hoist driven by a Minneapolis-Moline gasoline engine, which powers the derrick. A Manitowoc 50-ton 3000 B Special

"POW-R-DITCHER IS SUPERIOR FOR SMALL MAINS & SERVICES"

Says "Bud" Somerville and Supt. Jim Goodwin of the **SOMERVILLE CONSTRUCTION CO., Ada, Michigan**

"We have used several makes of ditchers and find the Vermeer 4T POW-R-DITCHER superior for installation of small gas mains and services. We get more footage with less destruction to landscaping. Our experience in this type of work covers a 15-year-period and a great variety of ground conditions."



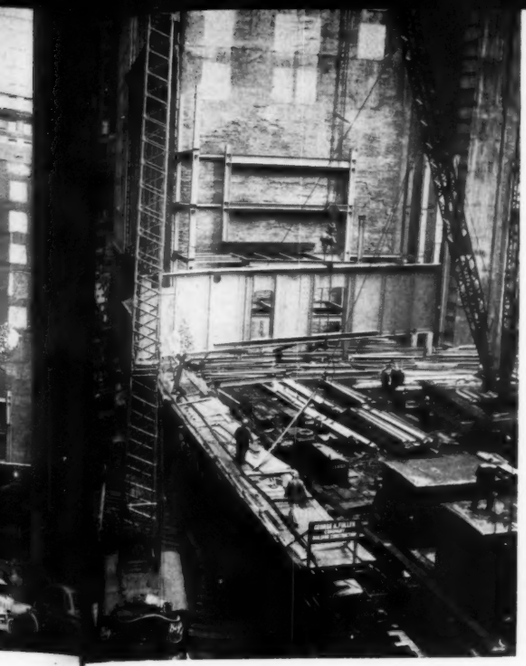
VERMEER 4T POW-R-DITCHER COSTS LESS . . . DIGS FOR LESS

This Vermeer "Midget Ditcher" is just the machine for laying gas pipe, service lines and digging foundation footings. Only 42" wide, 6' high, 13' long. Digs 6" to 14" wide and can be transported in a pick-up truck. Same size moving parts as larger models. Write for name of distributor and full information on the complete POW-R-DITCHER line.

Some Excellent Sales Territory Available

VERMEER MFG. CO., Pella, Iowa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 340



Equipped with a 100-foot mast and 90-foot boom, the American guy derrick lifts the girder with help from the Manitowoc. Web plate openings in the girder web will serve as doorways.
C&E Staff Photos

...mit removal of lower stories

by ANTHONY N. MAVROUDIS, field editor

crane with a 95-foot boom works at street level to assist in the lifting operations.

The girders are being delivered to these rigs on two low-bed trailer trucks, one pulling and the other, operating in reverse, pushing the load. The girders, delivered to pier 3 on the west side of Manhattan by barge, are being transferred directly to the trailer trucks to cut down on handling time. Their over-all hauling length—approximately 115 feet—and the narrow streets in the downtown area make the truck job difficult. New Street, forming the west-side boundary of the building, is about 20 feet wide and provides the only means of access for 10 of the girders. Trailers hauling to this site have to maneuver for about 15 minutes to make a left-hand turn at New Street, about a block away from the site.

When a girder has been delivered, and timber planks placed on New Street to prevent any damage to the pavement, the Manitowoc crane moves onto the street to lift one end of the girder so that the guy derrick can place a lifting bridle around them just to the right of its center of gravity. After a girder has been lifted a few feet, the trailer-trucks pull away to pick up another girder.

The plate girders, lifted by both the

(*Continued on next page*)

The INDUSTRIAL ALL-WEATHER CAB
WITH THESE OUTSTANDING FEATURES

- Complete visibility, when enclosed or open
- Equipped with large, shatterproof, glass windshield and side windows
- Easily and quickly installed
- Excellent appearance
- Moderately priced
- Well constructed

Gives Complete Protection from SUN, RAIN, SNOW and WIND

WHEN IT COMES TO FRONT END LOADER CABS
Industrial Cab Company is the place to buy them. We also manufacture a complete line of all types of cabs.

Write for literature

INDUSTRIAL CAB CO. 36 Jefferson Ave. Salem, Mass.

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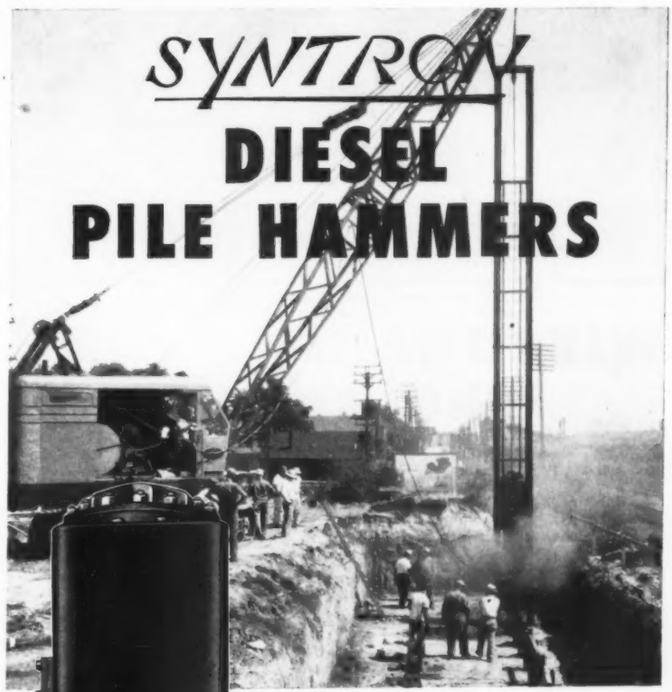
SYNTRON
DIESEL PILE HAMMERS



Tested and proved in the field of operation

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Syntron self-contained equipment provides the advantages of powerful driving power without the use of boilers, hose, firemen or compressors—easily attached to swinging leads of diesel cranes, quickly converts crane to mobile pile driving rig.

The improved Syntron Diesel Pile Hammers are rugged, heavy-duty constructed for driving concrete, steel or wood piling.

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Write today for catalog and specifications—FREE

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Need HOSE in a HURRY?

Suction • Water • Steam
Air • Multi-Purpose
Discharge • Pile Driver

Wherever your job is—*whenever* you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—*when* and *where* you want it.

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Continental Suction Hose is recognized nationally by contractors for its superior quality—not an ordinary hose, but a hose built for rugged, dependable service. Sizes 1½" through 12", for water and/or sand suction. Send for catalog of HOSE and PROTECTIVE CLOTHING.

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The American guy derrick prepares to set the first girder in place between two columns founded on concrete piers. The girder will be fastened to angle plates which have been welded to the column webs by high-tensile bolts. *C&E Staff Photo*

(Continued from preceding page)

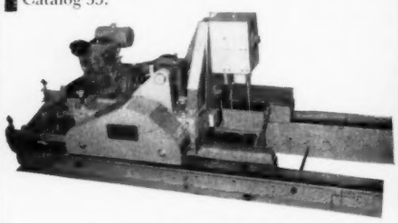
crane and the derrick, are being placed so that they extend from the fifth floor level to the sixth floor. Since openings in the girder web plates will provide doorways on the fifth floor, tenants will, without realizing it, pass through the girders. Sixteen girders are being placed double, four pairs on either side of the building, and fastened to columns by means of high-tensile bolts. The girders run east-west and require two spans to extend the full 150-foot width of the building. Each span, consisting of a double girder, is being bolted to the column flanges. A double column between the spans is braced to serve as an integral unit. This will allow the web plates of the girders to be bolted to the column flanges and act as a continuous girder for the entire width of the building.

Columns supporting the girders are 14-inch WF 320-pound rolled sections approximately 110 feet long. Built up in three vertical sections, which were weld-connected, they extend from the column footing piers founded on bed rock, to about one foot above the girders. Only two girders will act as single girders. These were placed between the column flanges and the girder web fastened to angles welded on the column web by Russell, Burdsall & Ward bolts. Bolt connections are being made with Chicago Pneumatic impact wrenches powered by an Ingersoll-Rand 315 Gyro-Flo air compressor.

Architects specified the big girders, which in effect will support the top twenty-two floors of the building from

Pave gutters, curbs and sidewalks in half the time at half the cost with a DOTMAR PAVER!

The Dotmar requires far smaller paving crew, eliminates use of face forms—readily paves up to 10′ of finished curb and gutter per minute. Paves integral gutter, curb and sidewalk or sidewalk alone. For highway widening strips and median strip too. Greater concrete yield. Concrete is tamped mechanically. Send for Catalog 55.



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"The size of a pistol—power like a cannon"

Dotmar INDUSTRIES Inc.

519 HANSELMAN BUILDING KALAMAZOO, MICHIGAN

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WISCONSIN ENGINE POWER

at Work on the Ohio Turnpike

In building the Ohio Turnpike, a great variety of Wisconsin-powered construction equipment was employed, including sub-graders, automatic curing machines, compactors, spreaders, pumps, finishers, concrete saws and rugged, portable generators such as the Maginnis Model HG-4B-TF unit shown above, made by Maginnis Power Tool Co., Mansfield, Ohio. This unit is supplying power for two HCV-3 Maginnis Hi-lectric concrete vibrators, at work on a bridge abutment in forms up to 12 ft. deep. The generator is powered by a Wisconsin Model TF 2-cylinder Heavy-Duty Air-Cooled Engine.

On the rough, dirty jobs where heavy-duty serviceability is a "must", you can always depend on Wisconsin Engines to *come through* and keep the job moving. Standard features on all models, from 3 to 36 hp., include: self-cleaning tapered roller bearings at *both* ends of the crankshaft; impulse coupled high tension rotary *outside* magneto; pump-circulated lubrication and efficient AIR-COOLING at all atmospheric temperatures from sub-zero to 140° F.

More than 2200 Wisconsin approved service stations and distributors are on the job, ready to serve you, throughout the United States and Canada, not counting parts and service distributors and dealers in 82 foreign countries.

You can't do better than to specify "Wisconsin Power" for *your* equipment. Write for Bulletin S-165.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

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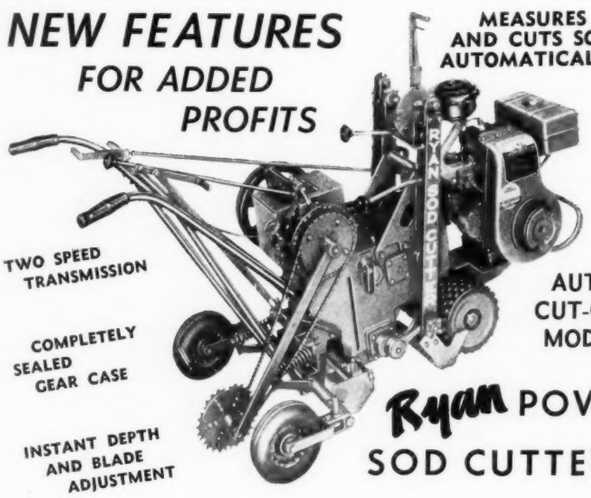
NEW FEATURES FOR ADDED PROFITS

MEASURES AND CUTS SOD AUTOMATICALLY



TWO SPEED TRANSMISSION

COMPLETELY SEALED GEAR CASE

INSTANT DEPTH AND BLADE ADJUSTMENT

AUTO CUT-OFF MODEL

Ryan POWER SOD CUTTER

Designed for ruggedness and dependability, the Auto-Cut-Off Model with instant depth and blade adjustment, two-speed transmission, completely sealed gear case and increased engine horsepower . . . features that make RYAN now, more than ever, the finest power sod cutter in the field.

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Division of Quality Built RIM Machine Works, Inc.

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Dept. K1, 871 Edgerton St., St. Paul 1, Minn.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 346

Two low-bed trailer trucks, which had to maneuver about 15 minutes to get into narrow New Street, haul a 54-foot-long 12-foot-deep girder to the job. One of the trucks operates in reverse to handle the load.
C&E Staff Photo

the fifth floor, because of a special problem created when the New York Stock Exchange leased a large portion of the structure.

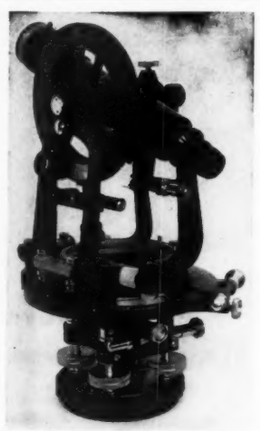
The Exchange is now headquartered in its own building, which forms the northern boundary of the new structure, and it has taken part of the second and third floors of the new building, with an option to lease the rest of these floors as well as the fourth floor at the end of any five-year period. It expects to use this space to expand the trading floor into the new building. Since the space required by the Exchange must be free of columns, the framework had to be constructed so that the columns between the second, third, and fourth floors could be removed without affecting the rest of the building. Existing doorways in the Exchange, two on the second floor and one on the third, will be incorporated into the new building to provide access between the two structures.

Bolted and welded connections

Aside from those used on the huge girders, bolts will be used for intermediate beam connections. All remaining column connections, or any other type of connection within 3-feet of a column, will be welded.

Welded rather than riveted connections are being used, according to Lehigh, because the method is more economical, faster, and less noisy. The many tall buildings and the narrow streets here amplify any loud noise in the area. Then too, only one man is

(Continued on next page)



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Here's the modern way to save money and materials in your re-bar tying operations . . . and ensure greater safety at the same time.

Using Cal-Tie Wire on handy reels is much more economical than the old-fashioned shoulder coils. Waste from excessive cut ends is reduced . . . waste incurred when coils are put down and forgotten is eliminated.

Light and compact, the wire on reels can be used in cramped quarters. Kinking and tangling of wire does not occur. Worker efficiency is kept high. Cal-Tie Wire on the handy reel dispenser makes tying much safer, too. Workers can't be thrown off balance by coils catching on protruding objects. Loose ends which might trip workers or get in their eyes are eliminated. Scratches and subsequent infections are prevented.

Try Cal-Tie Wire on reels on your next project. And remember to specify Cal-Tie Wire—produced by CF&I from ore to finished wire. Available in gauges 14 through 20, Cal-Tie Wire coils fit any standard tie wire dispenser. Contact our sales office or the nearest CF&I distributor for full information.

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3463

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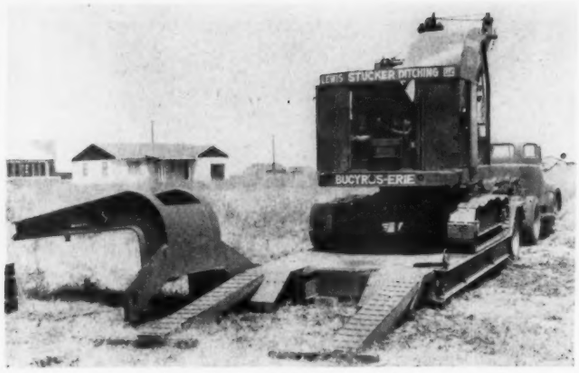
Product parade



EQUIPPED WITH FULLY-HINGED GOOSENECK (left), a Loadcraft Model M-308LB double-deck single-axle low-bed semitrailer takes aboard a Bucyrus-Erie crawler shovel. The trailer has a capacity of from 4 to 15 tons. For details circle No. 175 on card at page 18, or write to **Spencer-Safford Loadcraft, Inc.**, Augusta, Kans.

HIGHWAY MAINTENANCE TRUCK takes on sand from a Haiss Model 135 W2 loader on a Massachusetts job. The unit, powered by a Cummins Model HRCI-400 110-hp diesel, is reported to load 15 yards of sand into a dump truck in one minute 45 seconds. For details circle No. 178 on card at page 18, or write to the **Pettibone Mulliken Corp.**, Rome, N. Y.

Here's the Inside Story of Why You Get Lasting Accuracy, Eliminate Costly Repairs with . . .

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DUSTPROOF BALL BEARING CONSTRUCTION!

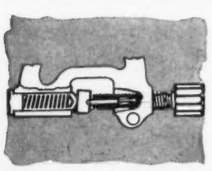
Engineer's Transit Model 50

Think surveying instruments are all pretty much alike? The "inside story" shows you why Brunson instruments are different—why they assure lasting accuracy and minimum maintenance unrivalled by any other instruments. The big difference is dustproof ball bearing construction!

Located in the spindle and telescope axis, Brunson ball bearings are permanently lubricated by an all-temperature grease and sealed against dust and moisture. Preloaded and accurate to 5-millionths of an inch, these ball bearings provide highest possible instrument accuracy. With dust sealed out and lubricant sealed in, wear is practically eliminated by the smooth ball bearing action. That's why your Brunson instrument stays accurate and operable year-in-and-year-out, where others fail. You save hundreds of hours in on-work time, avoid costly errors, slash routine repair and maintenance expense to a level undreamed of in the past.

You pay no more for Brunson's exclusive ball bearing construction. Mail coupon today for the complete "inside story".

You Get These Big Advantages, Too!



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Please send me information on Brunson Surveying Instruments.

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Address_____

City_____ County_____ State_____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 349

(Continued from preceding page)

needed to make a welded connection, as against the four or five needed for riveting. The only welding done for this job took place during the shop fabrication of the girders. Lincoln and Smith welders, used to make the connections on the new building, are powered by a Murphy diesel that also drives a Chicago Pneumatic air compressor. All this equipment is located at second floor level.

Foundation problems

Even before steel erection started, job problems cropped up. The first occurred for subcontractor Slattery Contracting Co., Inc., Maspeth, Long Island, N. Y., which started its $900,000 job after three buildings formerly occupying the site had been demolished.

Slattery dug down about 50 feet in an area measuring 150 feet along Exchange Place, 121 feet along Broad Street, and 131 feet along New Street. The present building of the New York

The answer to successful use of

HIGH STRENGTH STRUCTURAL BOLTS

This impact wrench calibrator makes it easy to accurately tighten every bolt to specified tension. Permits on the job determination of wrench performance. Simple adjustments are then readily made to make the wrench stall when proper tension is reached.

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For more facts, circle No. 350

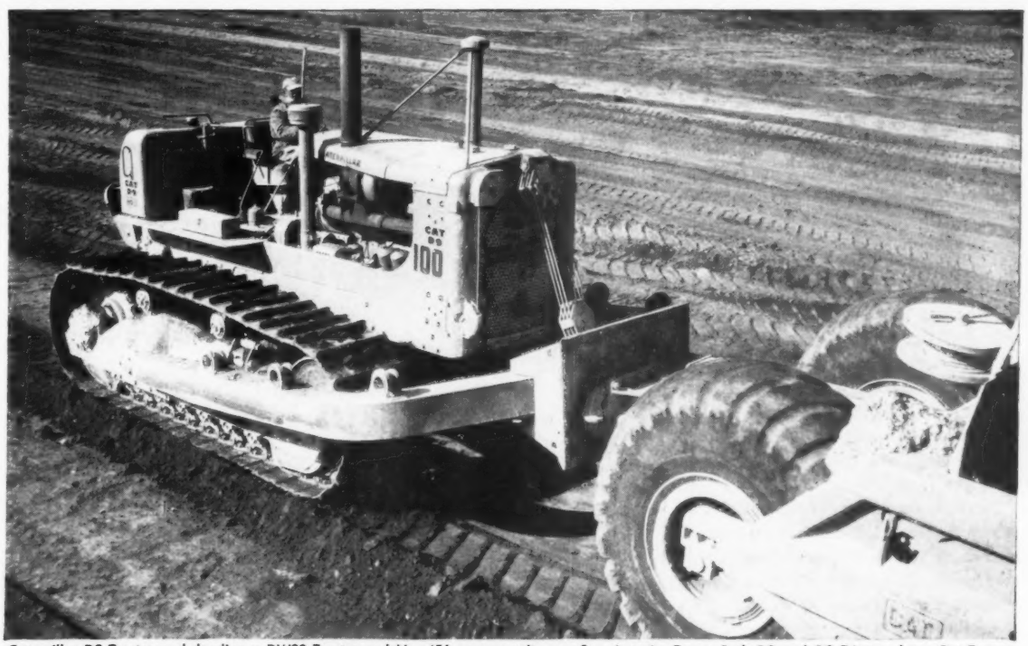
S-L SPANNALL, A SIMPLIFIED HORIZONTAL SHORING with built-in camber for form work in reinforced-concrete jobs, facilitates long span construction, eliminates intermediate vertical shores, and frees space below the forms for storage or other work. For details circle No. 181 on card at page 18, or write to **Universal Builders Supply Co., Inc.**, 51 E. 42nd St., New York 17, N. Y.

MOTORISTS USING THE $3.5 MILLION Dauphin Island Bridge over Mobile Bay in Alabama are afforded a maximum of safety and protection by the 35,000 feet of Armco Flexbeam guardrail installed along the sides of the 29-foot-wide roadway. For details circle No. 182 on card at page 18, or write to **Armco Drainage & Metal Products, Inc.**, Middletown, Ohio.

Stock Exchange forms the fourth boundary of the new structure. Slattery carried the excavation 20 feet below the foundations of the old buildings, which dated back to 1897. These foundations consisted of concrete-filled steel caissons along the perimeter of the excavated area. Many caissons were also found that made up the intermediate footings of the old buildings. This type of foundation had been constructed to penetrate an existing quicksand condition and to reach bed rock.

Before Slattery began removing the caissons, he placed steel diagonal bracing at both corners of Exchange Place, setting five layers as excavation went deeper. Steel sections were tied into the existing caissons along Exchange Place, which were incorporated into the foundations of the new building, and the caissons at both corners. Additional bracing, consisting of two steel trusses, was placed between Broad and New Street, along the existing wall of the Exchange.

(Continued on next page)



Caterpillar D9 Tractor push loading a DW20 Tractor and No. 456 scraper unit near San Antonio, Texas. Both D8 and D9 Tractors have Cat Torque Converter Drive available as optional equipment— standardizing on Twin Disc Torque Converter components.

BUY **BIG ORANGE** AND YOU BUY THE BEST

Shackle Chain HOOKS

Use on "HIGH TEST" Chain

EXTRA STRONG

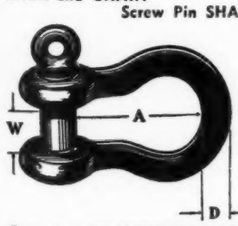
Even the pin is made of hi-strength steel and heat-treated.

SAVES TIME Can be attached anywhere on the job. Only a pair of pliers needed.

GRAB HOOKS Available for Chain Sizes 1/4" 5/16", 3/8" 7/16", 1/2" 5/8"

SLIP HOOKS Available for Chain Sizes 1/4" 5/16", 3/8" and 1/2"

ANCHOR and CHAIN Screw Pin SHACKLES



Forged of HI-STRENGTH STEEL Available in sizes 1/4" to 2". EXTRA STRONG —EXTRA TOUGH. Self-colored or galvanized Order from your Distributor or Write

MIDLAND INDUSTRIES, INC.

Cedar Rapids, Iowa

For more facts, circle No. 351

6 profitable reasons for having a *torque converter* in your crawler tractors

For high work output . . . and *long equipment life,* more and more contractors are ordering their new Caterpillar D8 and D9 Crawler Tractors complete with Cat Torque Converter Drive.

Torque converter drive offers *six profitable,* proved features applicable to your crawler tractors. 1. Three-stage design provides the highest engine output torque multiplication available. 2. Engines deliver *constant* high-horsepower output. 3. Power is *automatically* matched to load demands, with gear-shifting minimized or eliminated—operator efficiency is boosted. 4. Heavy load pick-up is smooth, even, without clutch slippage —resulting in less track slippage. 5. Overloads, shock loads and vibrations are cushioned, through *fluid* connection . . . providing *long* tractor life with a minimum of maintenance. 6. Infinite variety of ratios are available to work with, permitting smooth, accurate control of loads and delicate "inching" under power.

Wherever earth and rock are moved, tractor owners are using these six basic advantages *to convert their horsepower into more profits.* That's why Caterpillar designed a torque converter drive for optional use in the D8 and D9. They worked closely with Twin Disc Engineers, and for the torque converter driven models *standardized* on Twin Disc Torque Converter components.

See your Caterpillar dealer today for complete information on a torque converter-equipped Cat D8 or D9 Tractor.

TWIN DISC

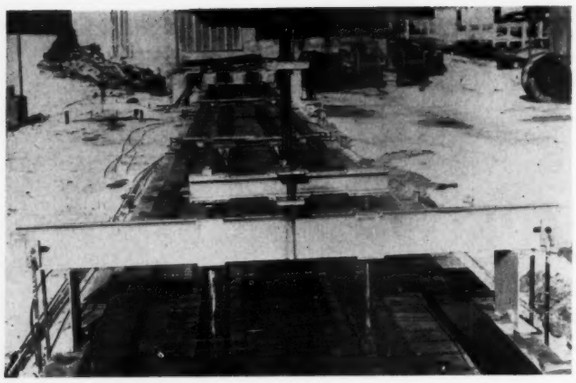
TWIN DISC

Torque Converters

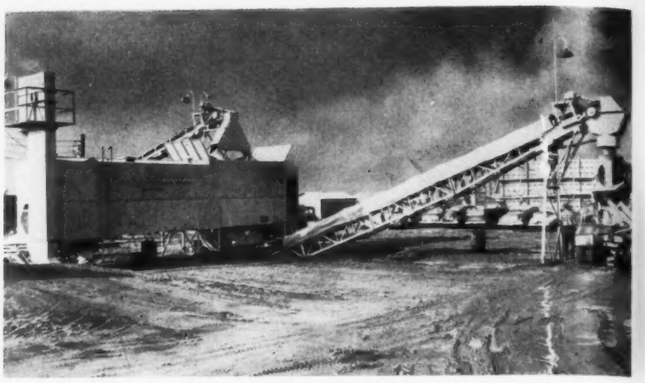
TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division), Rockford, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 352

Product parade



NEWEST OF THE FORM-CRETE products is this camber control device in use on a 420-foot poured-in-place double-tee casting bed. Device aids in accurate regulation of cable depression during curing stage. For details circle No. 176 on card at page 18, or write to the **Florida Division, Food Machinery & Chemical Corp.**, Lakeland, Fla.



NEW NOBLE-MOBILE AUTOMATIC BATCHING-plant-on-wheels is driven on highway to job site and goes quickly into production with no field wiring, footings, or crane time required on base plant. Ten-inch removable wheels can be used as spares on truck mixers. For details circle No. 180 on card at page 18, or write to the **Noble Co.**, 1860 Seventh St., Oakland 20, Calif.

(Continued from preceding page)

After removing all the intermediate and perimeter caissons and rehabilitating the caissons along and at the corners of Exchange Place, Slattery built concrete column-footing piers directly into bed rock. Some of these were built directly on rehabilitated caissons. This was done by filling the compressed-air working chamber of the caissons with concrete and removing all the timbers used in the construction of the working chambers. When this had been done, the column piers were built over the caissons, which went down to rock. Concrete supplied by ready-mix trucks was used to fill the caissons and pour the column piers, the deepest of which is 18 feet.

During construction of the column piers, Slattery placed a total of 20 permanent diagonal braces along the three outside faces of the excavation, since it was felt that the concrete slabs making up the sub-basement, basement, and first floor would not provide adequate lateral support to the street fills. Made up of steel sections, from 14-inch WF 127-pound sections to 14-inch WF 184-pound sections, the bracing extends from bed rock to the existing caissons. Both ends of the bracing were grouted in place.

Anchor bolts not used

When work had been completed on the footings and bracings, the subcontractor began backfilling the areas between the concrete column piers. The top 18-inches of fill, brought up to the level of the footing surface, consisted of 12 inches of crushed gravel on a 6-inch sand bed. Before pouring the 6-inch reinforced-concrete slab, Slattery covered the gravel course with Sisalkraft paper. The slab is designed to rest not only on the fill but also around the edges of the concrete pier.

Rectangular timber formwork was placed on top of the piers so that an opening was formed for the steel billet plate. This plate, varying in thickness from 1½ to 8-inches, had angle plates welded on top so that columns could be automatically and correctly positioned when the billet plate was aligned. The plate was

HAUL 6½ YDS. WITHIN
Low-weight chassis design of
New Reo F-506M guarantees it!
POWERED BY REO'S OWN OH 160
GOLD COMET ENGINE—GAS OR LPG...
BACKED BY REO'S OWN 100,000 MILE
OR 1-YEAR ENGINE WARRANTY!
REO
14,000 LBS.

The certified chassis weight of Reo's new F-506M is 11,240 lbs. The official weighmaster's receipt proves how it can haul 6½ yds. of concrete and stay well within legal limits. The new Reo F-506M is designed and built specifically for mixer use. Its increased payload is made possible by Reo's new high-strength, low-weight *double-side-rail frame construction.*

The new Reo F-506M actually hauls up to 2 yards more than the average mixer chassis. And it places as much as 6,000 pounds more on the front axle than other conventional mixer trucks.

Reo full power steering, which is standard, makes maneuvering easy in tight places anywhere.

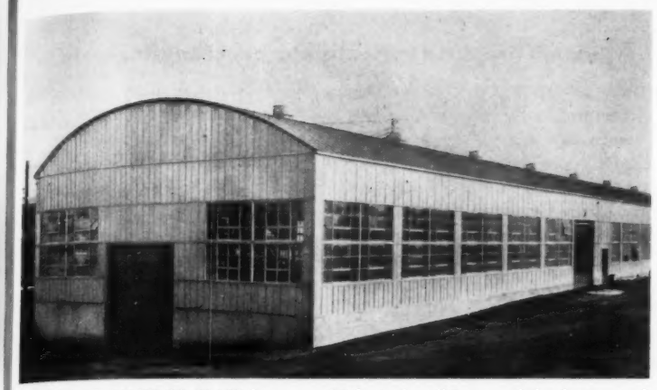
The new F-506M is powered by Reo's own 160 hp short-stroke, wet-sleeve Gold Comet Engine. Plenty of power for both truck and mixer. And, it's backed by Reo's famous *100,000 mile or one year warranty.*

Reo's exclusive *front-axle-payload* design places more weight forward—giving you an extra 2 cubic yards of concrete every trip. With it, you can haul your regular daily volume with fewer trucks and drivers . . . or increase volume without increasing your fleet.

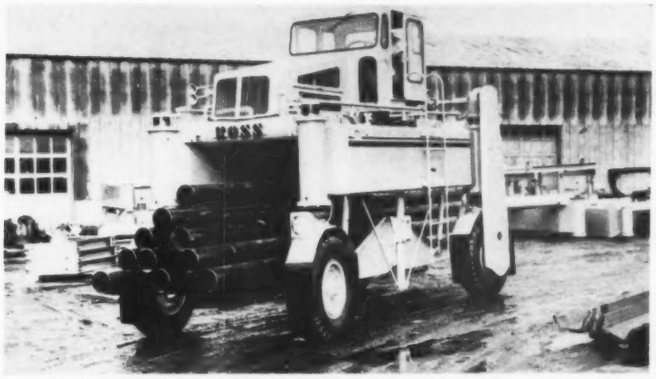
For states that permit greater axle loadings than 32,000 lbs., Reo builds the F-536M—52,000 lbs. G.V.W.

Additional hundreds of pounds can be added to the carrying capacity of the new Reo F-506M with Reo's optional front-end power take-off. The PTO also eliminates extra fuel and maintenance costs of the mixer's auxiliary power unit.

Call your Reo branch or distributor today and get the facts on the Reo that's right for you. Mail the coupon for full information.

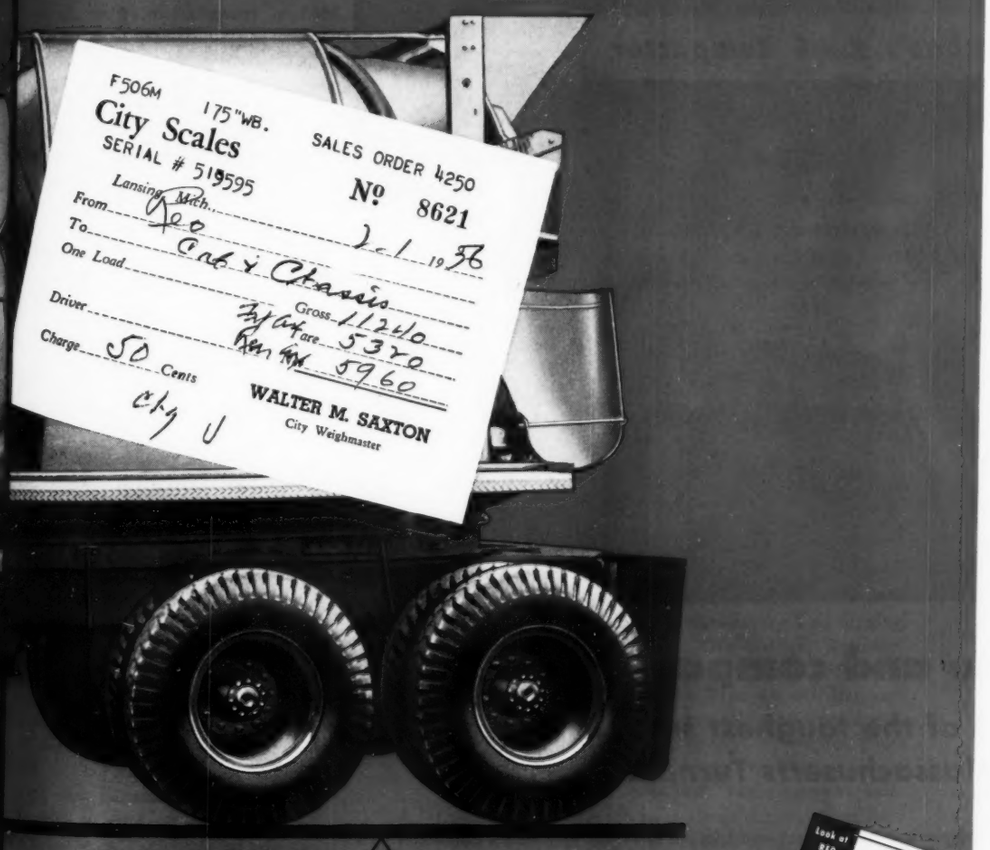


FORTY-EIGHT PANES OF GLASS for every 16 feet of wall is one of the features of this Brookville all-steel fully-insulated building, which houses manufacturing operations of the American Cast Iron Pipe Co. at Birmingham, Ala. The windows are all double ventilating. For details circle No. 177 on card at page 18, or write to **Brookville Mfg. Co.**, Brookville, Pa.



REPLACING OLDER MODELS IS the Clark Series 93 straddle carrier. It features new 5-speed syncro-mesh transmission, 15 per cent more horsepower at the wheels, fully hydraulic control of load hooks, and four-wheel radii-arc steering. Top speed is 38 mph. For details circle No. 179 on card at page 18, or write to the **Ross Carrier Division, Clark Equipment Co.**, Buchanan, Mich.

IIN 2,000 lb. TANDEM LIMIT



REO

REO MOTORS, INC.
LANSING 20, MICHIGAN
SUBSIDIARY OF BOHN ALUMINUM AND BRASS CORPORATION

Please send at once:
☐ Complete Specifications on F-506M. ☐ Reo Front-End Power Take-off. ☐ New Tandem Catalog.

NAME
COMPANY
TITLE
ADDRESS
CITY COUNTY STATE

For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 353

grouted after alignment to set it firmly in place.

The use of the billet plate to set the steel columns meant that no anchor bolts were necessary for the operation. The remaining void was grouted to complete the concrete slab surface around the column bases. A waterproofing course, doubling as a wearing surface, consisted of a 1-inch cement finish. This slab forms the second sub-basement floor and is approximately 50 feet below street level. Three more floors, the sub-basement, the basement, and the first floor—spaced at 17 feet, 11 feet, and 14 feet, respectively bring the building up to the street level. The remaining floors, which will be erected with two light guy derricks, will be spaced at about 12 feet and will be made of cinder concrete slabs 5 inches thick. Reinforcing wire mesh, as well as the structural steel framework of the building, will be completely encased with this type of concrete. A concrete plant will be set up on one of the basement floors and the mix hoisted to the various floors when this subcontracted concrete work starts.

Believed to be one of the tallest all-welded structures in New York City, the building is scheduled for completion by the end of this year. It will have a total of 371,000 square feet of space for renting, and will be completely air conditioned by Worthington 1,120 and 590-ton units located in the basements.

Personnel

John F. McCarthy is the superintendent, and Eugene Blaine, assistant superintendent for George A. Fuller Co. The project engineer for Fuller is Leslie St. George. Frank Sevier is the superintendent and Don Lonergan, field engineer, for Lehigh Construction Co. Charles Mayer is the consulting structural engineer for the project, which was designed by Kahn & Jacobs and Sidney Goldstone, New York, N. Y. The structure is being built by 20 Broad Corp., a subsidiary of General Realty & Utilities Corp., New York City, which has Edmund F. Wagner as president. THE END

A list of coming conventions, of interest to our readers, appears on page 91 of this issue.

Mounted on a Caterpillar motor grader this Cook pneumatic-tire ditch roller compacts effectively to a depth of six feet.

Rubber-tire ditch roller tamps backfill effectively

■ Delivering 1,650 pounds of tamping weight through two pneumatic tires, a unique new ditch roller compacts effectively to a depth of six feet. On 6-inch-thick layers of backfill, the manufacturer reports obtaining 100 per cent compaction.

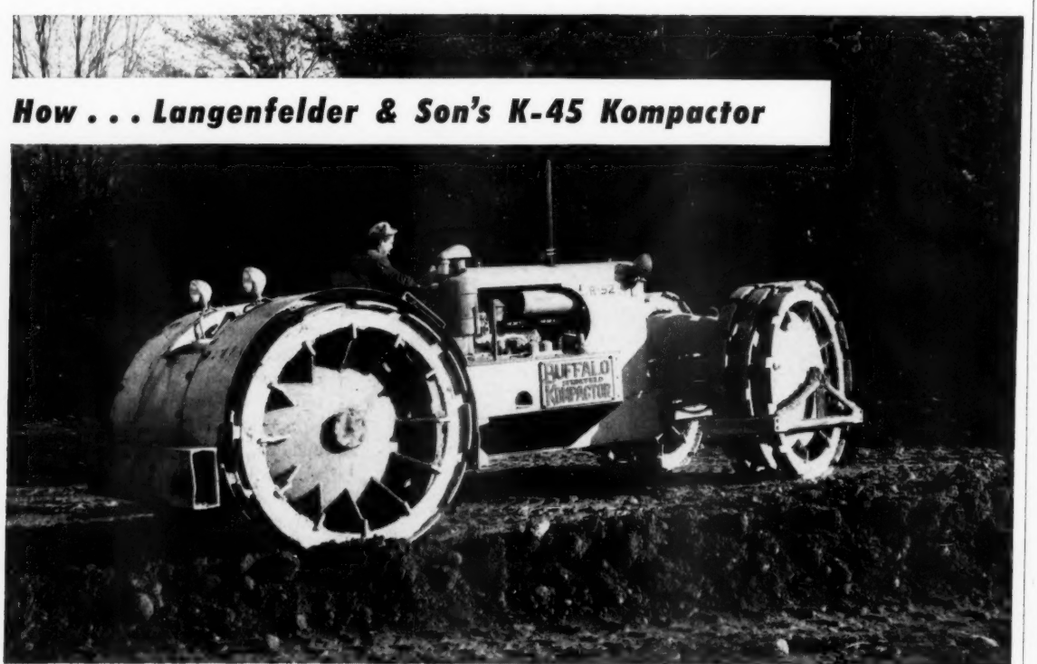
The Cook ditch roller can be mounted on Caterpillar 12, 112, or 212 motor graders to work behind wheel or ladder type ditchers cutting up to 24-inch trenches. The attachment is mounted on the front frame of the grader through studs in four ⅝-inch holes.

Cable, fed from two drums furnished with the equipment, positions the roller into or out of a ditch. The drums replace the scarifier arms, with the scarifier being either tied up or removed while the roller is in use.

The leveling blade at the front of the roller is adjustable so that it can be lowered as the ditch is filled. It can be leaned back or forward to keep it level, regardless of the depth of the roller in the ditch. This leveling blade can also be turned to either the left or the right, depending upon the side from which the dirt is being backfilled.

The manufacturer reports that the pneumatic-tire ditch roller has been used sucessfully to compact backfill on a 20-mile stretch of pipeline in South Carolina.

For further information write to John R. Cook, P. O. Box. 597, Augusta, Ga., or use the Request Card at page 18. Circle No. 148.



How . . . Langenfelder & Son's K-45 Kompactor

is cutting time and compaction costs

. . . on one of the toughest sections of the Massachusetts Turnpike

C. J. Langenfelder & Son., Inc. of Baltimore (owner of three Buffalo-Springfield K-45 Kompactors) has the largest single contract, money-wise, on the eastern half of the Massachusetts Turnpike, and the second largest on the entire 123 mile project. Their 5.37 mile section includes 17 bridges and the big Auburn Interchange.

Langenfelder's problem of proper compaction in the shortest time at lowest cost on this project is solved by the Buffalo-Springfield K-45 Kompactor.

The self-propelled highly maneuverable K-45 gives the highest degree of compaction with fewest passes. Its "Interrupted Pressure Principle" directs all compaction effort downward —the pads enter loose material with minimum displacement. Normal compaction time and costs are drastically reduced. It leaves a smooth finished surface that prevents moisture from penetrating the material after rolling is finished. And, the K-45 works *close* to bridge abutments, eliminates 90% of the hand tamping.

Every way you figure it, the K-45 Kompactor saves time, meets density requirements and cuts costs. Check today with your Buffalo-Springfield distributor for full facts . . . and send for the latest K-45 Kompactor bulletin No. S-67-455.

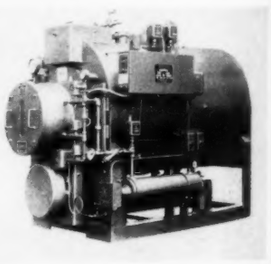
BUFFALO ROLLER COMPANY — THE STANDARD OF COMPARISON — SPRINGFIELD SPRINGFIELD, OHIO, U. S. A.

THE LEADER IN COMPACTION EQUIPMENT DESIGN AND MANUFACTURE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 354

New automatic boiler for limited quarters

■ A new Continental automatic boiler that handles up to 50-hp requirements, yet is small in size and meets conditions where space is limited, has been announced by Boiler Engineering & Supply Co., Inc. The Model N50 measures 7 feet 2 inches long, 3 feet 4 inches wide, and 5 feet 2 inches high.

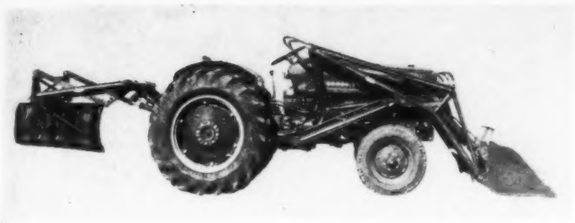


The new Continental automatic boiler handles up to 50-hp requirements.

A packaged or fully-assembled unit, the boiler is equipped with burner, boiler trim, automatic controls, Fiberglas insulation, and metal jacket. It can be furnished to burn light oil, No. 5 oil, or gas. Combination units that burn either gas, No. 5 oil, or light oil can also be supplied. The burner is a forced-draft type, designed to fire any one of the above fuels. If desired, quick change-over can be made from one fuel to another.

The boilers are built in accordance with ASME and state codes, are made of flange and firebox-quality steels, and are electrically welded. Controls include pressure or temperature switch, low water cutoff, electronic-type combustion safety control, fuel solenoid valves, and burner motor starter.

For further information write to Boiler Engineering & Supply Co., Inc., Phoenixville, Pa., or use the Request Card at page 18. Circle No. 33.



The new Hefti Loader, 1/3-cubic-yard bucket loader, may be mounted on either the front or rear of the International 300 tractor.

New loader features slip-on design

■ A new Hefti Loader for the International Model 300 utility tractor is said to form a compact, rugged piece of equipment when teamed with a heavy-duty dozer blade and a utility bucket. The blade and bucket can be mounted interchangeably on either the front or the rear of the loader, thus offering added versatility.

The loader also fits the Oliver Super 55 and other tractors, with only a small bracket change. It is of the new slip-on design and mounts easily. Side-mount framing permits convenient step-on and off.

The bucket has a ⅓-cubic-yard struck capacity, with a lifting height of 8¾ feet from ground to tripped scoop tip. Lifting capacity is 2,000 pounds, and the depth of dig below ground for both the bucket and the dozer is 9½ inches.

For further information write to the Henderson Mfg. Co., 1203 Rockford Road S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 130.

Computer features one-hand operation

■ Two models of the Curta portable calculator are available from the National Office Machine Co., new American distributor for the European-manufactured instrument.

The Model I weighs 8 ounces and accommodates $8 \times 6 \times 11$ digits; the Model II weighs 12 ounces and can handle $11 \times 8 \times 15$ digits. Both models add, subtract, multiply, divide, square, cube, and extract square roots.

The computer can be operated by one hand for all but the final step of a calculation.

For further information write to the National Office Machine Co., 229 S. Wabash Ave., Chicago 4, Ill., or use the Request Card that is bound in at page 18. Circle No. 119.

For more facts, circle No. 355→

Galvanizing machinery

■ A zinc coating that resists weather, salt spray, and heat up to 400 degrees F may be applied to road and highway equipment, tanks, towers, and piping, according to a bulletin from Wilbur & Williams Co. The only requirement before Zinc Shield is applied is that the surface be dry and free from grease, oil, old paint, and loose rust or scale. The coating is applied by brush, spray gun, or dipping.

To obtain this bulletin write to Wilbur & Williams Co., 130 Lincoln St., Boston 35, Mass., or use the Request Card at page 18. Circle No. 12.

Lincoln reports rise in number of welded bridges

The Lincoln Electric Co., Cleveland, Ohio, has reported that the Department of Public Works of the State of New York has designed and constructed approximately 800 welded steel bridges since 1942. The method has been chosen for reasons of economy and public safety.

PROOF OF LIMA QUALITY

William Wortman's four quality built Limas gang up to rush completion of the closure on a retaining dike . . . for a large storage reservoir near Stuttgart, Ark.

"Our four rugged LIMAS hit paydirt on *all* our digging jobs . . . tough or easy!"

says William Wortman, Stuttgart, Arkansas Contractor

"Our four rugged LIMAS hit paydirt on *all* our digging jobs . . . tough or easy!" So says William Wortman, drainage and levee contractor of Stuttgart, Arkansas. He has three Type 34's and a Type 44—all draglines—handling his heaviest digging jobs. One machine is 22 years old and still going strong . . . keeping pace, bucket for bucket, with the newer draglines.

Bill Wortman goes on to say: "These ruggedly built LIMAS stay on the job hour after hour, day after day, year in and year out. They handle the toughest jobs with ease, and without costly breakdowns. You can't help but make money when you have a hard-working, durable machine like LIMA . . . and a good distributor to service it."

You, too, will hit paydirt when you depend on LIMA, designed and built with the emphasis on quality . . . to give you top performance on the toughest jobs, at low operating cost, without expensive maintenance and repair.

COMPARE QUALITY!

No other machine gives you as much as LIMA!

1. Piston ring type dirt seal rings and retainers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings.
5. Big capacity drums and sheaves.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts.

COMPARE and you'll specify crawler, truck or wheel mounted LIMAS for *your* every construction equipment need. Get the full story today from your nearby LIMA distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

BALDWIN BLH LIMA-HAMILTON

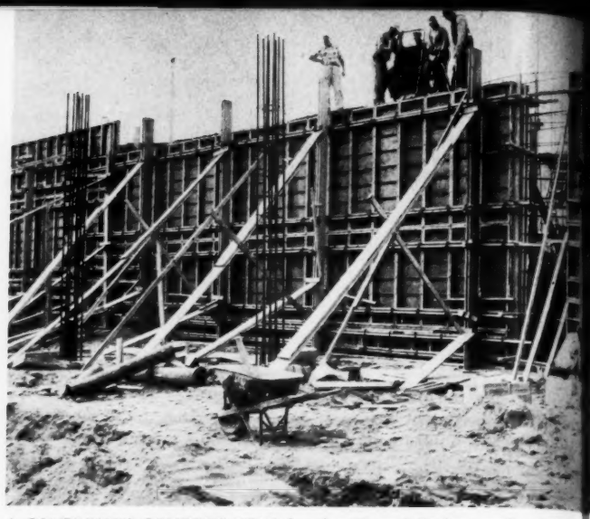
LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

Construction camera

DIGGING, LAYING, AND BACKFILLING operations are carried on simultaneously as Walter L. Follmer Construction Co. puts down 2,860 feet of 54-inch Armco pipe for a sewer line in Middletown, Ohio. The P&H backhoe works with a 60-foot powered conveyor built by E. F. Marsh Engineering Co., St. Louis.



A CONTINUOUS CONCRETE POUR for the 18 and 20-foot walls of the Cardinal Dougherty high school in Philadelphia, Pa., is made possible with 2 x 12-inch strongbacks, held in place on Symons forms with 12-inch standwall ties that keep the horizontal joints plumb.

Study of steel piling confirms strength, safety

An investigation of the suitability of bearing piles for foundation construction has revealed that the steel H-beam piles have far exceeded required strength. The test was conducted in the Loop area of Chicago, Ill., by the Armour Research Foundation of Illinois Institute of Technology.

Nine test piles, three each of 10, 12, and 14-inch steel, were subjected to the loads required by the local building code. Except for the closed end, all nine exceeded these requirements.

The investigation proved that steel H-beams can be driven through almost all overlying material for point bearing on suitable strata, such as hardpan or bedrock. The pilings can be used safely as foundations for modern skyscrapers, as buildings of any height can be founded on this type of pile without the limitations resulting from insufficient penetration.

Film shows process of resealing joints, cracks

A new 16-mm sound-color film shows the method used in resealing joint and cracks in a 30-year-old pavement in Connecticut. The 17-minute movie depicts the preparation of the joints and the actual application of Flint-seal hot-poured rubber compound.

In addition to the work itself, the film also covers testing procedures.

Films are available to interested groups through the Paving Products Section, Industrial Products Division, The Flintkote Co., 30 Rockefeller Plaza, New York 20, N. Y.

N. J. Parkway holds traffic safety record

The Garden State Parkway in New Jersey had fewer traffic accidents than any other superhighway last year. Along the 164-mile Parkway, there were no multiple-death accidents during the year and an average of fewer than four personal injury accidents per week in 1955.

During the course of the year, 808,600,000 vehicle miles were driven along the route.

TO THE BOYS WHO PLAYED IN THU

Remember those carefree, boyhood days when you romped through the old stone quarry? Limestone cliffs were towering castle walls in your imaginations. Rock piles were western forts to hold against the Sioux. Bluffs and ditches were mountains and valleys with outlaws lurking at every bend.

The day they brought in the new crusher, you stopped your games to watch as the engine chugged to life. To you it was just another piece of machinery — and a wonderful target for stones when the men had gone. But the echoes barking off quarry walls that day were crying the birth of a new industry. Modern roadbuilding had arrived!

Some of you never quite got the quarry out of your systems. You became quarry men and roadbuilders yourselves; and while you grew to manhood, the crusher you saw that day matured with you.

It was a German immigrant, E. A. Velde, who began its manufacture at Cedar Rapids, Iowa, in 1906. He combined the best feature of the Dodge crusher large bite at the receiving end of the jaw — with of the Blake crusher — a large bite at the finishing of the jaw. The result was the Universal ove eccentric jaw crusher with "force feed" action deliver a dependably uniform product.

When America transformed her dirt roads into ri of concrete during the early 1900's, the uniform this crushed product created a huge demand fo Universal crusher and it was sold in carload lots world over.

From this beginning, Universal became the produc the most complete line of portable crushing, scree washing and loading equipment in the industry. T Universal offers the largest overhead eccentric crusher on the market, the Universal 4448 — a pi of 50 years in engineering design and manufac experience. Improvements and refinements have added: Welded steel construction, anti-friction

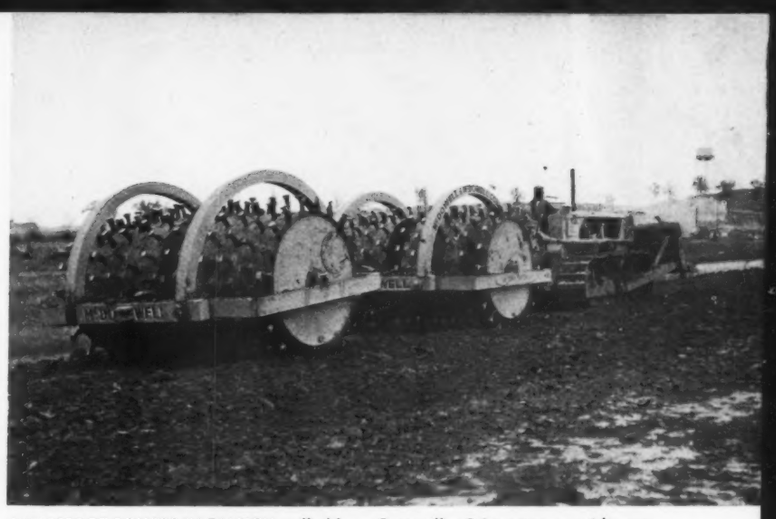
PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING

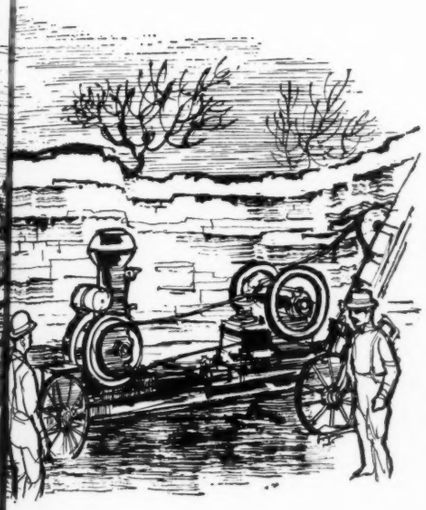
620 C Avenue N.W., Cedar Rapids,

A Subsidiary of Pettibone Mulliken Corp

EXCAVATION FOR A PRIMARY CLARIFIER and sludge digester tank for the Santa Monica subdivision in Jacksonville, Fla., is kept in the dry by a Griffin wellpoint system. A 30-hp electric motor powers the system, which consists of 200 feet of 6-inch header with 50 wellpoints installed on 4-inch centers.



SHEEPSFOOT ROLLERS IN TANDEM pulled by a Caterpillar D6 tractor, provide compaction at the site of the new Ford Motor Co. glass manufacturing plant being built near Nashville, Tenn. McDowell & McDowell, Nashville, is the grading contractor. The plant is one of several going up in the area.



THUARRIES IN 1906

gs, hydraulic bearing removal — but the basic principle overhead eccentric action, introduced by Universal 1906, is still the standby.

he boys who played in the quarries in 1906 and the niversal crusher came a long way together. Many more nce then have grown up with the roadbuilding industry nd like the men who laid our first highways have come know and respect the quality of Universal equipment.

hese men are now busy turning the quarries into per-highways and farm-to-market roads. They're work- g with Universal machines to insure tomorrow's pros- erity on the lifelines of commerce they are building oday.

o these men, who demand crushing equipment soundly nceived, expertly designed and precisely engineered, e pledge they will find the products of the Universal ngineering Corporation as unexcelled for performance nd reliability in the future as they have been in the past.

ERSORPORATION

Rapids,

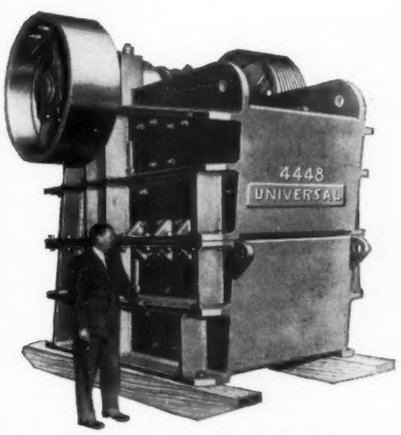
ken Corp 00 W. Division Street, Chicago 51, Illinois

Universal's original overhead eccentric jaw crusher.

1906

1906-1956 OUR 50TH YEAR

1956



Universal's newest overhead eccentric jaw crusher — the largest in the world.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 356

Pennsylvania to free ten bridges from tolls

By the spring of 1957, ten Pennsylvania toll bridges should be freed from charges. All purchased by the state from private owners after 1948, the bridges will be freed under a legislative provision specifying that the structures should be free after toll collections equal the cost of erection.

The bridges are: Clarks Ferry, Duncannon; Market Street, Harrisburg; Eighth Street, Allentown; Ellwood-Koppel, Ellwood City; Minsi Trail, Bethlehem; New Street, Bethlehem; Walnut Street, Harrisburg; and the Sunbury, Charleroi-Monessen, and Point Marion spans.

New official film shows Detroit Dam construction

A 29-minute sound-color film showing the progressive construction of the Detroit Dam on the North Santiam River in Oregon is available through the Portland District of the U. S. Army Corps of Engineers. Entitled "Challenge of North Santiam", the 16-mm movie shows the Big Cliff re-regulating dam and how the Corps of Engineers coped with the problem of construction in a limited area.

The film may be borrowed from the Division Engineer, North Pacific Division, 210 Custom House, Portland 9, Oreg.; and information about the project is available from the District Engineer, Portland District, 628 Pittock Block, Portland 5.

Handbook on masonry

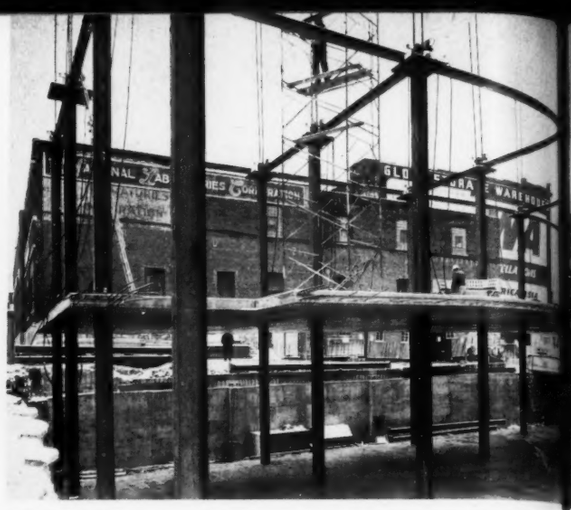
The fundamentals of sound, watertight masonry are discussed in a new book, "Exterior Masonry Construction", by Walter C. Voss, professor emeritus of building engineering and masonry at Massachusetts Institute of Technology.

Written for architects, masonry contractors, and engineering students, the book covers the influence of mortar, masonry units, design, and workmanship on good masonry. Photographs and drawings are used.

Single complimentary copies may be obtained from the National Lime Association, 925 15th St. N. W., Washington 5, D. C.

Construction camera

WIDENING OF U. S. 17 between Orlando and Kissimmee, Fla., from two to four lanes means that bridges along the section must be widened also. Pile driving for one of the new spans is being handled here by an American truck-crane powered by GM diesel.



UP INTO PLACE goes a 270-ton concrete slab for the Trans World Airlines office building in Kansas City, Mo. Floors are being constructed in 8½-inch-thick sections, then lifted into place by the Youtz-Slick method at the rate of 3 to 10 feet per hour. The building will be completed by mid-June.

Are You Ready to Get Your Share of the $325,000,000* Swimming Pool Construction Market?

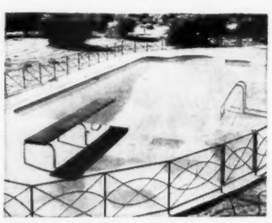
*Survey by Swimming Pool Age

AIRPLACO® Concrete Gunning Equipment Makes Pool Construction

FASTER • EASIER • MORE PROFITABLE

As the swimming pool becomes an increasingly familiar part of America's way of living, it opens up a tremendous new profit opportunity for you.

This opportunity can be even more profitable if you use AIRPLACO concrete gunning equipment for your pool construction jobs. You get the job done faster, easier, better and at a greater profit to you.



AIRPLACO PORTABLE RIG

The AIRPLACO rig consists of a job-proved BONDACTOR® or NUCRETOR,® the automatic proportioning, continuous mixing, elevating and screening MIX-ELVATOR, and the time-saving SAND-LOADER. Makes any concrete job easier, more profitable.

AIRPLACO concrete gunning equipment is available in a wide range of sizes to meet your production and job requirements from ½ to 7 cubic yards of aggregate per hour, and using air compressors with 75 to 600 CFM capacity.

FREE CATALOG

WRITE TODAY FOR FREE CATALOG . . . that will explain all the many benefits and specifications of AIRPLACO concrete gunning equipment or see your AIRPLACO distributor.

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1007 WEST 24TH ST. • KANSAS CITY 8, MO.

MANUFACTURERS OF ADVANCED DESIGN CONCRETE GUNNING, MIXING AND PUMPING EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 357

Civil Service exam for equipment specialists

An examination for positions as equipment specialists in the Department of Defense and other federal agencies in the Washington, D. C., area, will be given by the U. S. Civil Service Commission. An examination in construction machinery will be among these tests.

Salaries range from $3,670 to $11,610 per year. To qualify, applicants must have had appropriate experience in his field of specialization, plus experience gained in analytical, administrative, technical, or supervisory capacities. No written test is given.

Applications, which may be obtained from any post office or from the commission itself, will be accepted until further notice by the Board of U. S. Civil Service Examiners, Department of the Navy, Washington 25, D. C.

Let ONE Man Lift Heavy Loads Quickly - Safely with a BRADEN Winch

BRADEN Winches are adaptable for use on trucks, tractors, cranes and other mobile equipment used to move heavy loads. They are so fool-proof in design ONE man can lift and move equipment weighing thousands of pounds.

BRADEN Winches are available up to 100,000 pound capacities so are adaptable for safely handling practically any load.

See Your Braden Dealer or Write for Complete Information

BRADEN WINCH COMPANY
P. O. Box 547, Broken Arrow, Oklahoma

BRADEN Winches

"IN SERVICE AROUND THE WORLD"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 358

BOULDERS weighing up to 7 tons are removed from Portsmouth Air Force Base, N. H., with an International Drott TD-18A Skid-Shovel by Manchester Sand, Gravel & Cement Co., Hooksett, N. H. The firm holds the subcontract for stripping, grading, and surfacing at the base.

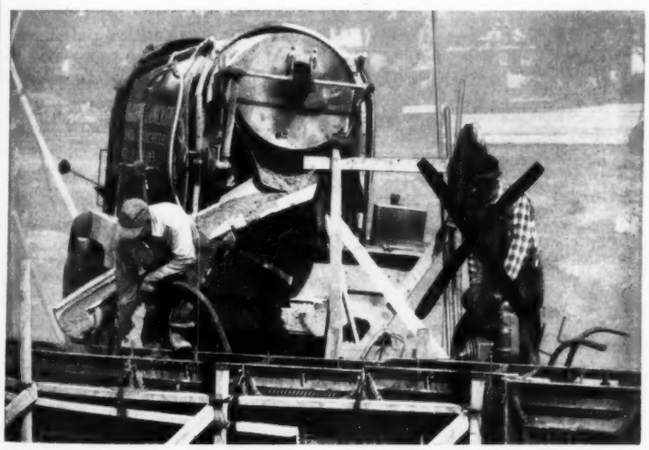
WORKING TOGETHER on a highway project near Melrose, Minn., two Bucyrus-Erie 22-B draglines excavate 3 to 12 feet of muck and peat from a swampy area that the new road will cross. Work on the state route is being done by J. & L. Construction Co., Long Prairie, Minn.

Euclid schedules course of service training

A factory-training course covering trouble-shooting and maintenance and service methods for all Euclid earthmoving equipment is scheduled to open at the General Motors Training Center in San Leandro, Calif. The course will run from April 30 to June 25.

Classes will be limited to six men. General instruction classes will be of two weeks' duration, while those on specific units will last for a week. Special attention will be given to new models.

All Euclid owner and dealer service personnel in the San Leandro area are eligible for the course. Information and enrollment applications may be obtained from the Service Training Department, Euclid Division of General Motors Corp., Cleveland 17, Ohio.



NEW MASTER "1-MAN" VIBRATOR CUTS VIBRATING COSTS IN HALF

Only 25 lbs. Easy to handle.

It weighs 25 pounds! It's all in one piece! It plugs into any regular 115 Volt AC or DC electric line . . . and with no heavy engine or motor to drag around, one man handles it easily.

The motor is sealed in the vibrating head, so there's no flexible shaft to get out of whack; no oiling or greasing problems; no kinking troubles.

No field maintenance is necessary: when motor head needs attention, snap it off and snap on a spare.

The vibration actually penetrates farther and leaves fewer voids in the concrete than old-style vibrators.

The price is *low*. The design has eliminated so much cost, and no special power source is required, but the big saving comes in use. Write for folder or ask your Master distributor for a free demonstration. You'll see exactly how the Master "1-Man" can cut your vibrating costs *at least* 50%.

MASTER VIBRATOR COMPANY
606 Stanley Ave., Dayton 1, Ohio

MASTER

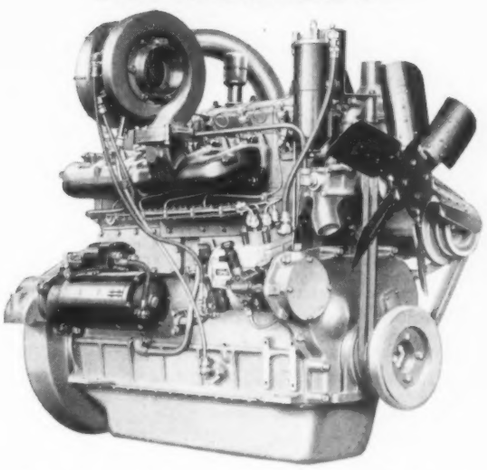
For more facts, use Reader-Reply Card opposite page 18 and circle No. 359

MODEL 180 MICHIGAN TURBO-DOZER—2¼ CU. YD. CAPACITY
power tilting bowl • all wheel drive • rear wheel steering
Waukesha Turbodiesel Engine • Clark torque converter and
power shift transmission, 4-speed full reversing type.

MICHIGAN
Turbo-Dozer

engineered and manufactured by Clark Equipment Company, Construction Machinery Division, Benton Harbor, Mich.

WAUKESHA
Turbodiesel



WAUKESHA MODEL 135-DKBS TURBODIESEL—165 HP at 2200 RPM—a 426 cubic inch Supercharged Diesel, 6-cyl., 4¼" x 3" with lively acceleration, clean burning, a tremendous reserve of power and great overall economy. Send for descriptive Bulletin 1617.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

50th ANNIVERSARY 1906-1956

306

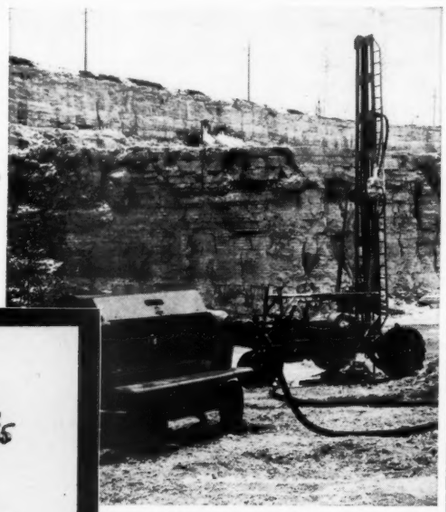
For more facts, use Reader-Reply Card opposite page 18 and circle No. 360

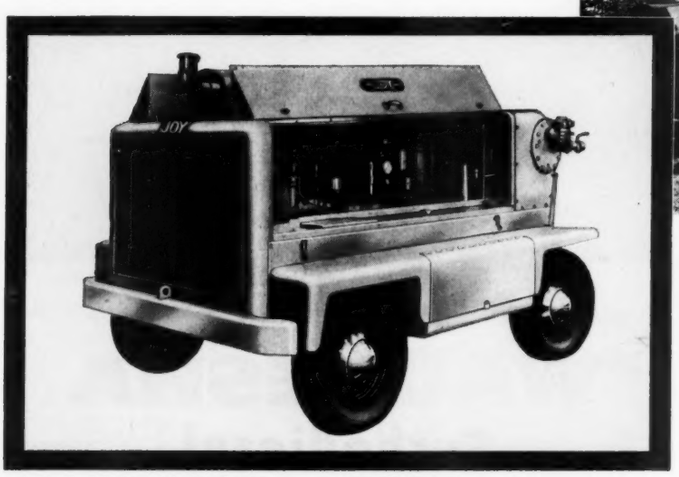
Construction camera

THE APPROACH for the new third tube of the Lincoln tunnel between Weehawken, N. J., and New York City, is paved with concrete reinforced with welded wire fabric. Grow Construction Co., New York, N. Y., is doing the paving and portal work. Truck mixers deliver the concrete.

TWO JOBS ARE COMBINED as a Gradall works along County Trunk Highway 0 southeast of Richland Center in Wisconsin. First, the roadside cut is being cut back. The excavated shale will then be loaded and hauled away for use as fill in a bridge-reconstruction job.

Not only NEW but DIFFERENT





Joy RP-600 Airvane Rotary Portable Compressor furnishing air for a Joy Challenger Drill in an Illinois quarry.

JOY AIRVANE ROTARY COMPRESSOR

Joy engineers started with all accumulated rotary information—then went on from there to produce, we believe, the best rotary compressor available today. These Joy developments contribute materially to a superior machine:

THERMAL BY-PASS Heats oil quickly, keeps it flowing into compressor at correct temperature—*under all weather conditions.* Efficient oil circulation system provides immediate lubrication (no dry starts).

SPLINE COUPLING Does away with a clutch, gives greater power-transmission efficiency. It's light, takes little space, is virtually indestructible.

TWO-STAGE FILTER-SEPARATOR Removes oil from air and returns it to circulation system so efficiently that oil consumption becomes a minor item.

ECONO-MISER load control automatically selects most efficient engine speed, maintains steady pressure, saves fuel, increases compressor life.

SHORTEST TURNING RADIUS Compact design and low center of gravity give the shortest turning radius of all rotaries. With light weight, this spells *maneuverability.*

OTHER FEATURES (often overlooked) Body is waterproof—tool box and fuel tanks can be locked—doors stay open without props—three lifting rings support entire machine—push-button uses ether-capsule for cold weather starting.

Write for complete information to *Joy Manufacturing Company Oliver Bldg., Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Write for FREE Bulletin 69-21

Consult a Joy Engineer

for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS
CORE DRILLS • BLAST HOLE DRILLS
PORTABLE HOISTS • FANS • BLOWERS • TUNNEL,
QUARRY, MINE EQUIPMENT

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JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 361

Book studies duties of resident engineer

The duties and responsibilities of the civil engineer supervising construction are set forth in a new handbook entitled "The Supervision of Civil Engineering Construction", by A. C. Twort.

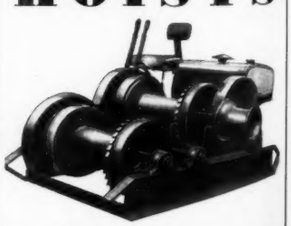
Divided into three parts, the text discusses relationships of the resident engineer with employers, contractors and engineers. Technical supervision and practical notes on the resident engineer's problems comprise part two. Part three considers specifications, bills of quantities, and contract drawings.

Published by St. Martin's Press, Inc., 103 Park Ave., New York, N. Y., the book may be purchased for $6.

BPR releases book of road statistics

"Highway Statistics, 1954", the tenth in a series of books presenting annual statistical data, has been re-

KING
HYDRAULIC CONTROLLED
HOISTS



Plenty tough for the big construction jobs. Double drum and single drum units. 1500 to 7500 lbs. capacity. Hydraulic brake type clutch on each drum. Truck type master cylinder on control. Wisconsin air-cooled engine. Timken bearings. Built better to hoist faster and longer. Ask for Bulletin 156.

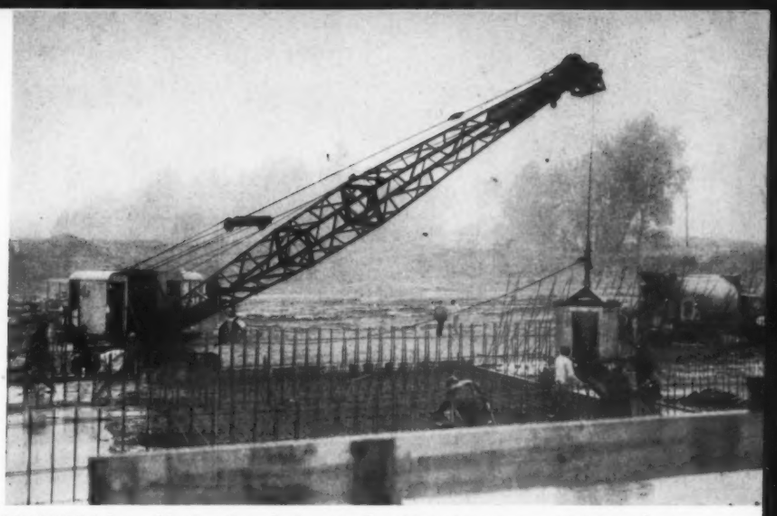
King 500 Series Portable Hoists for light construction jobs. Also Hydro-King Automatic Tower Hoists, King Electric Hoists, Car Pullers, Winches and Capstans. The most complete line.

Send for Catalog

KING MANUFACTURING CORP.
3138 W. Chicago Ave., Chicago 22, Ill.

For more facts, circle No. 362

DURING SITE PREPARATION for a new industrial plant on the Tennessee River near Loudon, Tenn., Harrison Construction Co., Knoxville, uses a Euclid S-18 scraper to pick up a heaping load of dirt in a cut section. A tractor gives the rig a push-loading assist.



CONCRETE delivered by Rex 6-yard mixers is placed by a Lorain crane with 1-yard bucket for the 12-inch slab that will support five aeration tanks for the Akron, Ohio, secondary sewage-treatment plant. Hunkin-Conkey Construction Co., Cleveland, is building the $3,900,816 facility.

leased by the Bureau of Public Roads of the U. S. Department of Commerce.

The 135-page book contains charts, tables, and text material relating to such topics as motor fuel; motor vehicles—their ownership, registration, and licensing; traffic; taxes; finance; and federal aid.

"Highway Statistics, 1954" may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 75 cents per copy. The Bureau of Public Roads will not handle book orders.

Booklet on building

A new booklet, "True Efficiency in Building", features a check list of functions leading to an analysis of each job. The list points up every important phase of the construction program.

Published by the Building Construction Employers' Association, the book is available from the association's headquarters, 228 N. La Salle St., Chicago 1, Ill.

"AMERICAN TUBULAR"

THE NO. 1 NAME IN ELEVATING TOWERS

ALL TUBULAR MEMBERS GALVANIZED

Available with material platform and/or concrete equipment in Heavy Duty and Light Duty models.

AMERICAN TUBULAR ELEVATOR CO.
DIV. UNIVERSAL MFG. CORP.,
Zelienople 12, Pa.

For more facts, circle No. 363

BUILT FOR ROCK-HARD ROAD WORK

The Allis-Chalmers HD-21 Crawler Tractor is a Natural for Tough Jobs

Chiseling roads through rock demands "something extra" in crawler tractor performance and durability, yet it's the kind of job any contractor's tractor may be required to do.

Conditions like this call for an Allis-Chalmers HD-21. Its 204-hp Allis-Chalmers engine is noted for its ability to perform with a minimum loss of efficiency even after thousands of hours of operation. Torque converter drive multiplies torque up to 4½ times . . . develops 41,500 lb drawbar pull at low speeds . . . cushions the entire power train against load shocks.

New Tru-Dimension tracks bring a new high in track durability. Thousand-hour lubrication intervals save maintenance time. Positive seals protect idler, support roller and truck wheel bearings from abrasive wear as no other seals can.

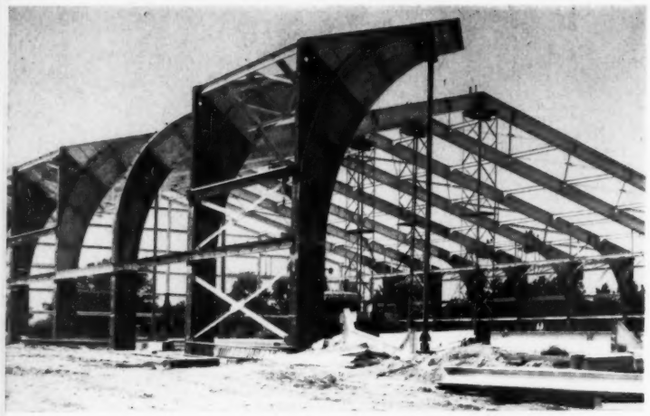
Ask your Allis-Chalmers dealer to show you the many other features that make the HD-21 a natural for rock-hard assignments.

HD-21
204 net engine hp
44,000 lb torque converter drive

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 364



The 10-ton knee sections for the Thomas E. French field house are temporarily positioned on pipe columns while the 90-foot-long rafters are being positioned by a crane.

Indoor field house built with shop, field welded frames

Rain, sleet, or snow will make little difference to the Ohio State Buckeyes going out for football practice this fall. By then, general contractor Joseph Silken & Co., Columbus, will have completed work on the new 200 × 400-foot indoor practice arena being built for Ohio State University.

The rigid frame structure, having a clear span of 200 feet, consists of 18 all-welded rigid frames and will be finished with concrete block, corrugated glass, and aluminum paneling. The paneling will form the end walls of the structure. Almost 2 acres of dirt floor in the building will be used for baseball and track practice, as well as football workouts. Altogether, 1,075 tons of steel are going into the indoor practice arena, which has a height of 52 feet at the center and 35 feet at the eaves.

To be known as the Thomas E. French field house, in honor of a member of the engineering faculty who had long been interested in the University's athletic program, the structure is being built on an old dump along the Olentangy River, in which some 200 piles have been sunk to support the building.

Field welding

Since the frames were fabricated in four sections, consisting of two column knee units and two rafters, only three welds were required for each frame. The two columns of each frame are tied together at the base with a 20-inch-wide plate, buried 2½ feet underground. These tie plates were butt welded in five 40-foot lengths.

Knee sections of the frames weigh

So light, so strong because it's made of Beth-Cu-Loy

Beth-Cu-Loy drainage pipe is so light it can easily be manhandled. Even long lengths are unloaded and placed without special lifting equipment. At the same time, Beth-Cu-Loy pipe has a world of strength because it's made of corrugated steel, sheet-metal in its strongest form.

Two mighty compelling reasons why builders of highways are using an increasing mileage of Beth-Cu-Loy culvert and drainage material!

But only the beginning. Once in the trench, pipe made of Beth-Cu-Loy is easy to connect and maintain in grade and alignment. No fancy trenching is needed, nor cradling in unstable soils, for a Beth-Cu-Loy culvert flexes with shifting and freezing actions. It has high impact- and vibration-resistance, and stands off corrosion through its galvanized coating and the copper content in the steel.

Beth-Cu-Loy culvert sheets conform to the rigid standards of the AASHO specifications, and are made by Bethlehem for fabricators of drainage pipe. If you would like further information about Beth-Cu-Loy Sheets, or the names of nearby concerns who make them into drainage materials, just get in touch with the Bethlehem district sales office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL BETHLEHEM STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 365

KIESLER
Since 1892
CLAM SHELL BUCKETS

- More POWER, deeper digging with less effort, due to leverage
- Rugged Construction
- Full loading—Fast operating
- New, improved wobble-free Head Beam and one-piece shell construction

Write for bulletin 10822

JOS. F. KIESLER COMPANY
928-944 W. Huron Street
Dept. CE1, Chicago 22, Illinois

For more facts, circle No. 366

Two column knee units and two rafters form a frame; steel is bolted together before being welded at the site

The 18 all-welded frames of the new indoor practice field complete the skeleton of the building, which will be finished with concrete block, corrugated glass, and aluminum paneling. The building, 52 feet high at the center and 35 feet high at the eaves, covers almost two acres.

about 10 tons each. They are made up of ⅞-inch web plate with compound flanges, 1½×16½ inches and 1×8 inches. Both the columns and the rafters are of 36-inch WF 230 pound rolled beams. The vertical columns below the knees are about 10 feet high; the rafters are each 90 feet long.

Before field welding was done, the frames were bolted together and knee sections supported on temporary steel pipe props, while the center of the frames was supported on portable towers.

The heavy knee column sections were fabricated by Lewis Welding & Engineering Corp., Bedford, Ohio, and Morgan Steel Products, Cleveland, under a subcontract from Builders Structural Steel Co., which is erecting the building. About half the welding job on the knee sections was done with Lincoln Electric's Jetweld, an iron powder-type electrode, and the remaining half with conventional coated electrodes. Stitch welding of the knee sections eliminated the possibility that excessive stresses would be locked up in the huge sections.

A huge basketball arena, being built next to the field house, will be connected to the new indoor practice structure by a common locker room. The field house itself will have no permanent spectator seats, but temporary bleachers will be set up on the ground when occasion demands them. The facility was designed by Howard Dwight Smith, and structural engineering was done by Barber, Magee & Hoffman.

THE END

RUNNING SAND TO

SOLID SOIL

IN MINUTES WITH chemject*

Water seeping through walls?
Excavating through running sand?

By injecting chemicals into the soil behind tunnel or basement walls, the soil can be rendered impervious and leakage stopped.

By injecting chemicals into sand in advance of excavation, tunneling and caisson digging operations can be simplified and progress improved.

Chemject engineers and chemists are available for consultation to discuss your job.

* Trade Mark

Chemject Corporation
3533 N. Cicero Ave., Chicago 41, Ill.

For more facts, circle No. 367

NOW ONLY 2 LEVERS FOR ALL OPERATIONS

LORAIN Full-Metered

"AIR-EASE" CONTROLS

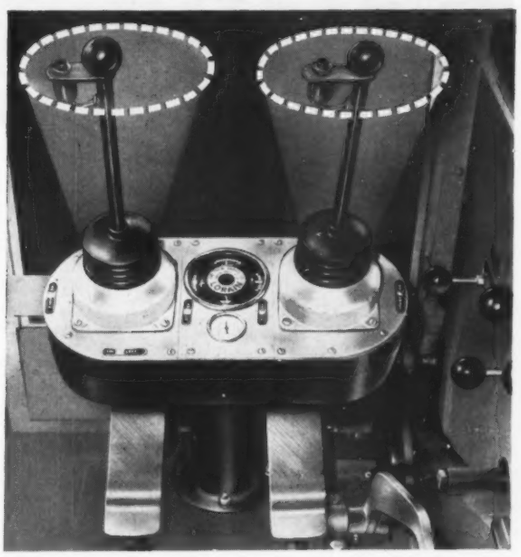
Reduce Operator Effort . . .
Provide Better Control

The latest Lorain advance brings a new era of operation to shovel-crane operators and owners. Now, Full-Metered "Air-Ease" operation controls all friction clutches. Now, two simplified hand levers replace the bank of awkward multiple levers of the past. These two levers put "Metered Air" to work feeding power to the clutches at any rate of flow desired. All of the old time "feel" and response is there, lever manipulation is simplified, effort is greatly reduced, speed is increased, control is more accurate. The range of air flow and power is at the precise command of the operator.

To the operator, here is a new day of operating ease and lack of fatigue. To the owner, no feature in years has added so greatly to production.

To be the first to put the new 2-lever "Air-Ease" control to work on your jobs, see your Thew-Lorain Distributor. Here is a feature your next shovel-crane should have!

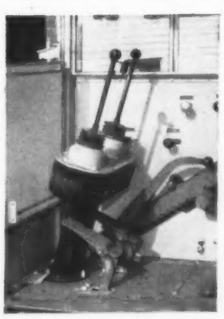
THE THEW SHOVEL CO., LORAIN, OHIO



LEFT LEVER — Yellow circle indicates the "wobble stick" action. By positioning lever in various directions within this circle, operator can swing the turntable right or left, or raise the boom up or down. Intermediate positions within the circle combine any of these operations.

RIGHT LEVER — In the very same rotating action, the operator can control these operations: (1) Main Hoist; (2) Secondary Hoist; (3) Clamshell Holding; (4) Drag or Hoe Drag-in; (5) Shovel Crowd-Retract; (6) Third Drum; (7) Power Load Lowering.

All operations described above are controlled by moving these levers forward or backward, from side to side for single operations, or "quartering" the levers for combined operations. Air booster operation of Hoist Brakes is available.



IMPROVED VISIBILITY

This view shows the clean, simple, 2-lever control arrangement in the operator's cab. Operator gets full view of work area, particularly on deep digging operations.

Intermittently used Full Air controls for crawler steering, turntable swing lock, tread-travel lock, shifting of travel-swing jaw clutches, are conveniently located on panel to right of operator.

The new 2-lever Full-Metered "Air-Ease" controls are now available on eight Lorain models, both crawler and rubber-tire mountings, in 20 to 30-ton range.

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This is the thirteenth in a series of articles consisting of excerpts from the 1,280-page book, "Moving the Earth," by Herbert L. Nichols, Jr., published last year. Priced at $15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at $15 plus postage.

Tunnel work

Rock tunnels are driven through solid material that usually requires blasting and may support itself permanently, or at least long enough to allow setting up of bracing after digging out a short section. Soft ground tunnels involve digging or pushing aside soil, and the roof (called the crown) and the walls may require support before removing the soil. Mixed-face tunneling involves going through both types of ground, either together or in different sections.

If a tunnel is driven more or less horizontally into a hillside, the opening is called the portal. The working face, where the digging is done, is the heading. Vertical-access tunnels descending from the surface to the main tunnel level are known as shafts.

In the tunnel itself, the floor is the invert, and the roof is the crown. The spring line is the meeting of the vertical side wall with the curve of the roof arch. A supporting shelf cut at this line is the hitch. A small pioneer or accessory tunnel is called a drift. Standard cross sections are rectangular, round, and horseshoe.

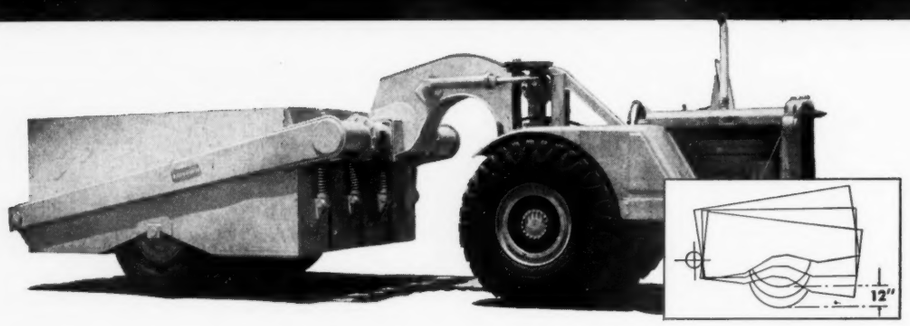
There are a great many special problems connected with even a simple tunnel project. To the open-cut man, one of the most impressive is lack of space. Many tunnels have been driven with cross sections as small as 4×4 feet—not even big enough to stand in. Twenty to thirty-foot-diameter tunnels are big, yet they provide a floor width that would be considered skimpy for a haul road on top.

Equipment

Equipment to be managed at and near a tunnel heading may include a drill jumbo (a movable frame almost as big as the tunnel, carrying a battery of drills); a machine for loading muck (the below-ground name for spoil) and rail cars or rubber-tire trucks to remove it; the same or other cars or trucks to bring drill steel, bits, explosives and other supplies to the heading; a locomotive to push and pull cars; and a switching or passing device to permit hauling units to get past each other, although there is often room for only a single width of track or roadway.

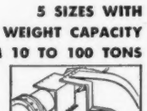
There will be high pressure air pipes to supply the drills, and often large low pressure ducts for ventilation. Overhead wires or ground cables carry electricity for light, power, and

for compacting earthfills
SELECT SOUTHWEST



Southwest **compaction roller**

5 SIZES WITH WEIGHT CAPACITY FROM 10 TO 100 TONS



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4. Each wheel equipped with two large Timken bearings.
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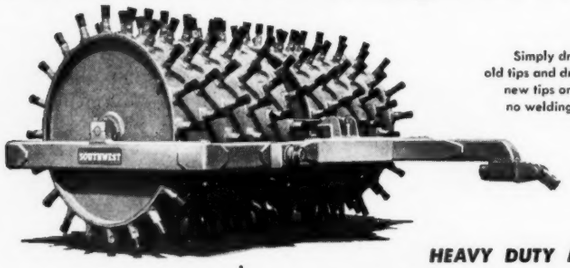
Southwest **sheepsfoot roller**



Simply drive off the old tips and drive on the new tips on the job—no welding required.

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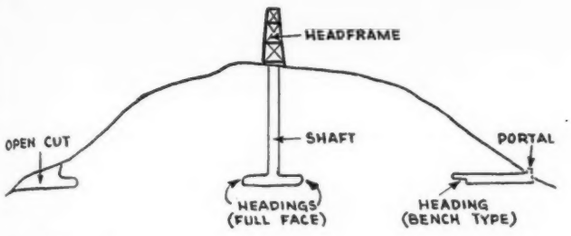
Motor vehicle registrations in Wisconsin have increased 2-1/2 times that of the population in the last decade until now there is one vehicle for every 2.68 persons living in the state. By 1965, the ratio is expected to reach the ratio of one vehicle for every 2.3 persons.



Tunnel layout

blasting. Water under pressure may be supplied for wet drilling. A system of drainage, pumping, or both may have to handle tremendous volumes of water.

In addition to the regular equipment there may be need for a diamond drill to make test and grouting holes, grouting equipment to seal off leaks and solidify wet ground, and/or a movable buffer to confine rock throw from blasts.

If the tunnel is to be timbered for support, or lined for support or for permanent use, the crews and materials for this work may follow the digging closely, and in any event will have to work in and over the single entrance way.

If driving is from a shaft, its bottom is another crowded point. Haulage equipment may be lifted to the top to dump, or dump into containers at the bottom. Supplies must be unloaded from the elevator cages and reloaded for hauling to the face. Men coming to work and leaving it, and supervisors and inspectors wait here for transportation to the surface. Pumps, compressors, and even drill and repair shops may be located in skimpy quarters excavated near the shaft.

Sequences are very exacting. The tunnel cycle (the succession of drilling, shooting, and mucking) must keep the largest possible number of men and machines usefully employed, and the time interval from any operation to its repetition should not vary. Whenever possible, two or more operations should be performed simultaneously, as drilling the top of a face while digging the bottom, and installing lining a few feet back at the same time.

When two headings driven from one shaft are close together, one may be drilled while the other is shot and mucked. With increasing distance the advantages of this arrangement are reduced.

Most tunnel crews are the universal type, and perform all operations in the cycle. This saves the contractor from paying a crew while it is forced to wait because of a delay in a prior operation.

Plant

The plant at a tunnel may include the tower, hoist, and hopper; compressors, low-pressure ventilation system, water pumps, electric trans-

(*Continued on next page*)

THE "O'HADI" ALL-WEATHER PATCHER

THE PRACTICAL ASPHALT MAINTENANCE MACHINE.

Heats the hole and the mix simultaneously.

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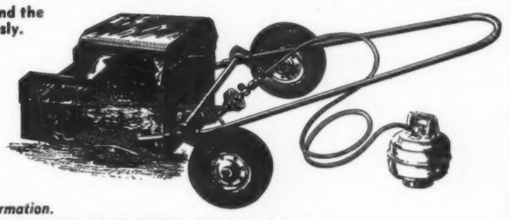

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On bridges and airport runways, on streets, highways, throughways, and expressways . . . *wherever concrete meets concrete* . . . Flexcell Bituminous Fiber Expansion Joint Filler is *doing a job!* For joints that are free from bulges or crevices, that stay closed under severest traffic and climatic conditions, Flexcell Filler has won coast-to-coast acclaim.

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(Continued from preceding page)

formers or generators, change room with showers and lockers, provision for emergency treatment of injuries, a blacksmith, forging, and bit-dressing shop; welding and repair equipment, and telephone or radio-communication systems.

Compressors are usually at the surface. They are usually of the two-stage type, and have an aftercooler as well as an intercooler to avoid transporting any heat of compression into the heading, which is often too hot already.

Alternating current is used. When possible, it is purchased from a utility. It is usually stepped down to 220 to 110 volts at the entrance, but on some jobs is taken in at several thousand volts, in armored parkway three-wire cable. Dry transformers (oil-filled ones are a fire hazard underground) are set about 1,000 feet back from the faces, and advanced in long jumps as progress warrants. This system avoids the power loss and voltage drop associated with long distance transmission of low-voltage current.

There may be three electric circuits in the tunnel—a 220 or 440-volt for power, a 110-volt for light, and a high-voltage line for firing explosives. Some operators standardize on 220 for both lighting and power. The 220 bulbs are sometimes a nuisance to get in this country, but they have the advantage of being useless in an ordinary lighting circuit, so they are seldom pilfered.

There may also be a 2-inch line to take water to wet drills. This water may have to be picked up outside the tunnel if the groundwater is heavily mineralized.

Surveying

Tunnel sections meet each other far from their portals or shafts, sometimes after curves, with uncanny precision. Differences usually vary between a small fraction of an inch up to several inches. These are too small to be noticed on the walls, but are measured at the surveyed center line (axis).

An underground direction is obtained by establishing a base line at the surface, running close to the line of the tunnel. This is very carefully done, and it is marked at frequent intervals by permanent monuments, with exact points pricked into copper bolts embedded in concrete.

Two plumb bobs weighing 20 to 30 pounds each are suspended close to the bottom of the shaft by piano wire from the surface. They are as far apart as shaft width permits. Vibration and tendency to swing may be dampened by hanging them in pails of water. Very careful observations are taken of the wires at the surface, relative to the proposed tunnel center line. Direction is identical with that of the same wires at the bottom.

Careful observations are taken of the bottom part of wires, using a very accurate instrument and special sighting device. Readings are taken over and over again, and the results averaged. The tunnel line is then established in the correct direction by reference to surface readings.

This work must be done at a time when men and equipment are not working, as ventilating currents and vibration can disturb the wires.

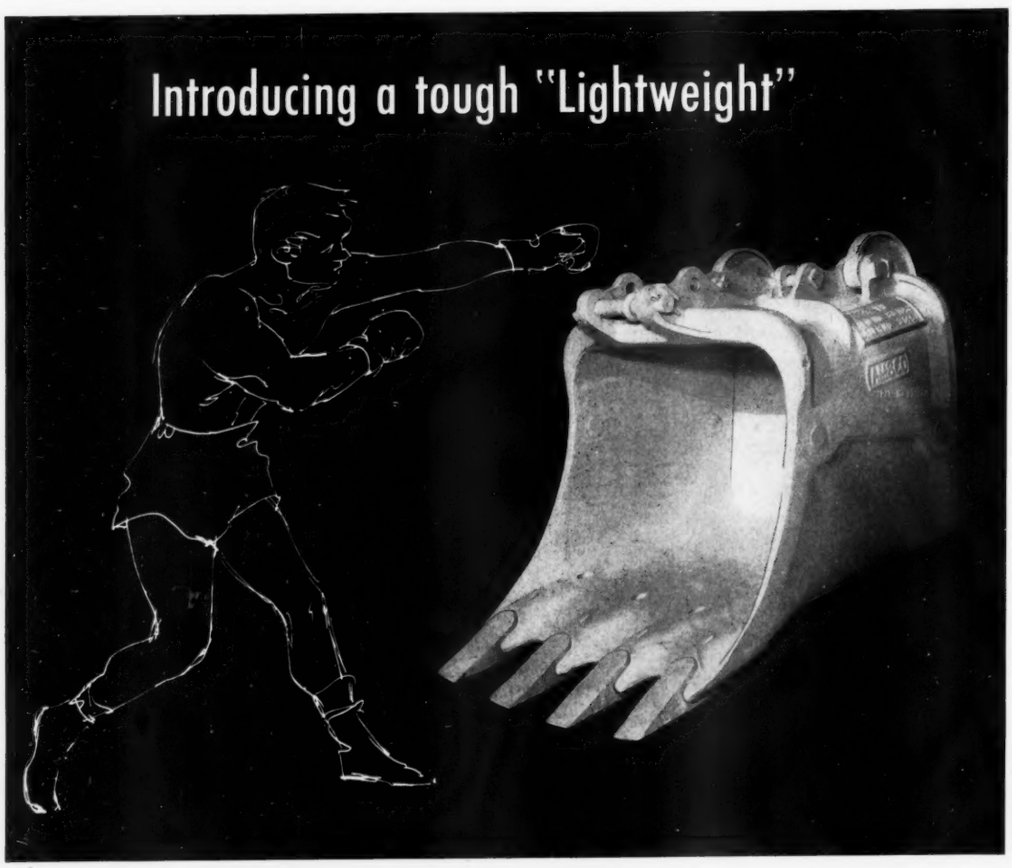
The line is extended through the tunnel on spads (markers) driven into plugged holes in the roof. These are also used for grade checking.

Tunnels are seldom driven blind. Preliminary drilling is done along the route to determine the type of rock, the amount of water to be expected, and the danger of mud slides. Test holes are drilled from the surface, usually with diamond drills that can bring up cores for inspection.

Diamond drilling may also be done from the heading, where dangerous conditions are expected. This precaution has often revealed the presence of such quantities of water or unstable soil ahead, that disaster might have resulted had it been broken into by a full-face blast.

Dangers

Underground work is naturally very dangerous, and it is greatly to the



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- One-piece manganese steel back castings
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- Lugs for handle, back, and braces are cast integral with back—for extra strength
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Ask your shovel manufacturer for full information—or write us direct for descriptive literature.

"Vital Statistics" on this new lightweight champ

Height of front over teeth	4 ft. ⅝ in.
Height of back	2 ft. 7 in.
Opening at top	2 ft. 5 in.
Opening at bottom	2 ft. 7 in.
Approximate weight	1550 lbs.

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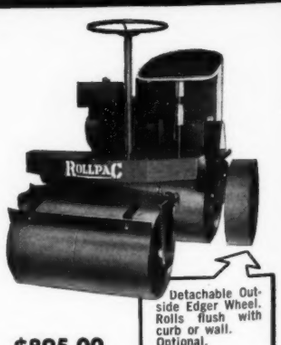

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credit of tunnel men and labor departments that there are so few accidents.

The most evident danger is that of collapse. Most soils and many rock formations will slump rather quickly into any hole cut under them. In any given material, this tendency increases markedly with depth. Below 500 feet even apparently firm rock may creep, and break off slabs with explosive violence. There is always danger of loose pieces falling.

Caving and breaking off are combatted with compressed air, timbers, steel and concrete linings, and holding bolts.

If the soil will not stand at all without support, bracing must be installed ahead of the digging; or the heading protected by a movable shield.

Water, with or without accompanying soil, may break into a tunnel in such volume as to flood it completely within minutes. Escape of men may be difficult, machinery is apt to be abandoned, and an expensive and tedious job of sealing off the water and pumping out the tunnel is often required before work can be resumed.

Fire must be carefully guarded against, particularly on jobs using compressed air and/or timbers.

Air conditions are difficult to keep healthy. Drills produce rock dust, and most air-powered machines have foul, oil-charged exhausts. Explosives produce fumes. Some clay and rock formations give off unpleasant or poisonous vapors. The increasing use of internal-combustion engines underground makes tremendous demands on ventilation systems set up to clear out dangerous or irritating exhaust gases.

Silicosis, a lung disease caused by breathing dust from rock drills over long periods, was formerly one of the greatest health dangers of tunnel

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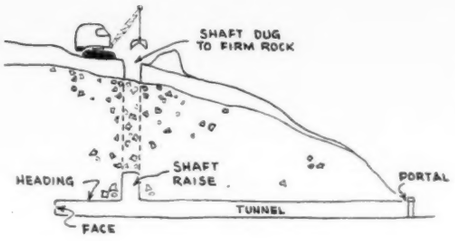
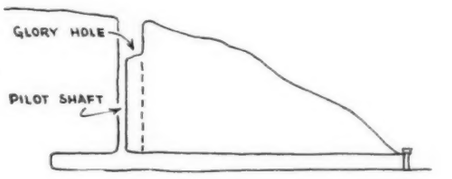
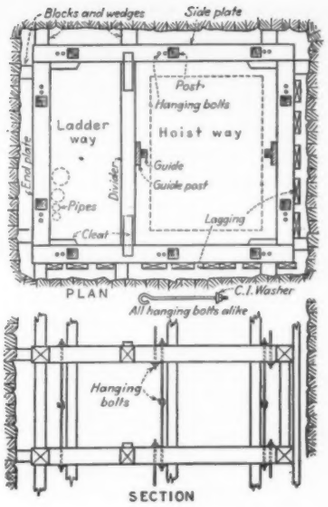


◄ Raise and glory hole shaft excavation.





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45 TONS PER HOUR OF CONTINUOUS-FLOW MIX!

This **MODEL G60** batch type plant, with fully automatic controls, is producing 180 tons per hour for North Carolina owner. Built-in running gear and self-erection equipment assure easy moving and set-up.

That's just a sample of the production range in the Cedarapids COMPLETE line

What will your next bituminous paving contract call for? A 3-ton batch of high type hot mix every minute? From 45 to 200 tons per hour of multiple aggregate continuous-flow mix? Batches for one-time orders? Single aggregate cold mix for patching or "commercial" work?

Whatever production you need . . . whatever specs you have to meet...Cedarapids has the exact plant to meet your requirements, newly designed to make the most money for you.

The **MODEL CM** continuous-flow plant (right) is averaging 45 tons per hour for profitable "commercial" jobs . . . surfacing driveways, parking lots, etc.

MORE CEDARAPIDS PRODUCERS

MODEL G40 batch type plant has all the "plus" features of the G60 except size and capacity. Designed for jobs requiring around 120 tons per hour.

MODEL H15 is a batch type plant built for jobs requiring 35 to 60 tons per hour. Stack-up, tower-type design easy to move and erect

MASTER PLANT continuous-flow twin shaft mixing unit, gradation control unit and drier, produces up to 200 tons of specification mix per hour.

Typical Examples of High Production

Producing surface and binder mix, a continuous-flow type Master Plant met exacting Federal specifications at a 150-ton-per-hour pace.

Owner says 100 tons per hour average of his Model G40 batch type plant could easily be kicked up to over 120 tons per hour if he needed greater production.

A new Model H15 batch type plant in Canada is meeting Ontario Highway Department specs and producing 60 tons per hour.

A Model G60 batch type plant, the second purchased by a Baltimore contractor, produced 180 tons per hour for the Garden State Parkway.

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(*Continued from preceding page*)

work. It now can be almost entirely avoided by wet drilling and good ventilation. The Delaware Aqueduct used 10,000 feet of air a minute at each heading. A standard requirement is 1,500 cfm per drill.

Shallow rocks are cool, but in deeper work an increase of 1 degree F for every 50 feet of depth can be expected.

Noise is deafening, particularly during drilling, as the sound echoes back and forth in the confined space. Diesel engines add to the uproar.

Shafts

Shafts—vertical passages between the tunnel and the ground surface over it—are required for the majority of tunnel jobs. They are sometimes the only access. Even when there are portals, shafts shorten the time required to do the work, as each makes it possible to work on two extra headings. In addition, underground hauling is a headache, and runs should be kept as short as practical. Some shafts are part of the permanent tunnel project.

The advantages of shafts must be balanced against the considerable expense of sinking and equipping them.

Shaft location may be chosen to keep depth to a minimum, as in the troughs of valleys over the tunnel; to take advantage of an easily worked or stable formation; or on the basis of surface conditions such as cheap land, nearby dumping areas, or distance from areas where noise and appearance might be considered objectionable.

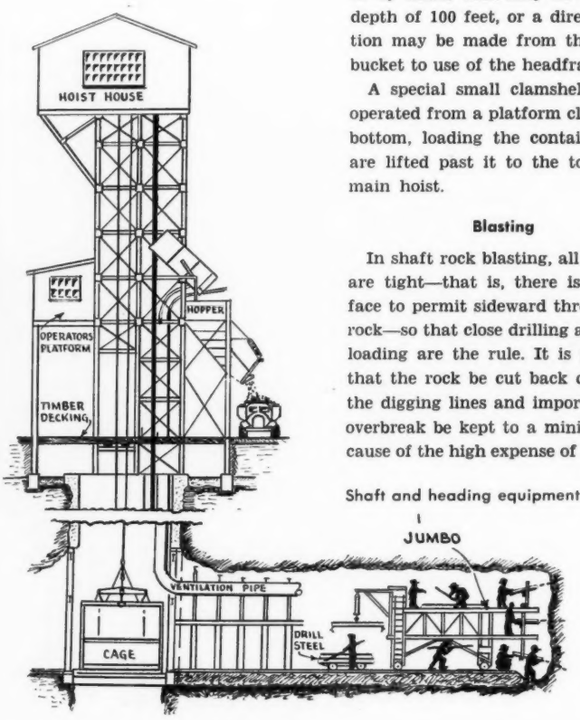
Shaft size is highly variable, depending largely on the volume of material it must handle and the size of objects that must be lifted and lowered. A minimum size—about 11 by 13 feet inside the lining—accommodates a single hoist and supply elevator and a ladderway. The ladderway includes a ladder, electric and high-pressure air lines, water-pump discharge pipe, and ventilator ducts, all of which must be protected from swinging loads or falling chunks.

The headframe is a tower of prefabricated steel, or may be built with timbers. This carries the hoist sheaves, dumping mechanism, and the discharge chute or hopper. The hoist engine and winch is ordinarily in a separate structure nearby.

Digging is started with a clamshell, which can dig soft soil unaided, and remove hard soil and rock after they have been loosened. One or two signalmen direct the operator's movements, as he cannot see the bottom, and any wrong move with the heavy bucket might be disastrous to the workers. The clamshell is ordinarily not used below a 25-foot depth.

The next stage may be to replace the digging bucket with a light bucket or container that is lowered to the floor, and loaded by hand or by equipment suited to the cramped work space. The container is raised out of the shaft by the hoist line, swung to the side, and dumped by a trip device or by hand. This may be used to a depth of 100 feet, or a direct transition may be made from the digging bucket to use of the headframe hoist.

A special small clamshell may be operated from a platform close to the bottom, loading the containers that are lifted past it to the top by the main hoist.



Shaft and heading equipment.

Blasting

In shaft rock blasting, all the holes are tight—that is, there is no open face to permit sideward throw of the rock—so that close drilling and heavy loading are the rule. It is necessary that the rock be cut back cleanly to the digging lines and important that overbreak be kept to a minimum because of the high expense of removing

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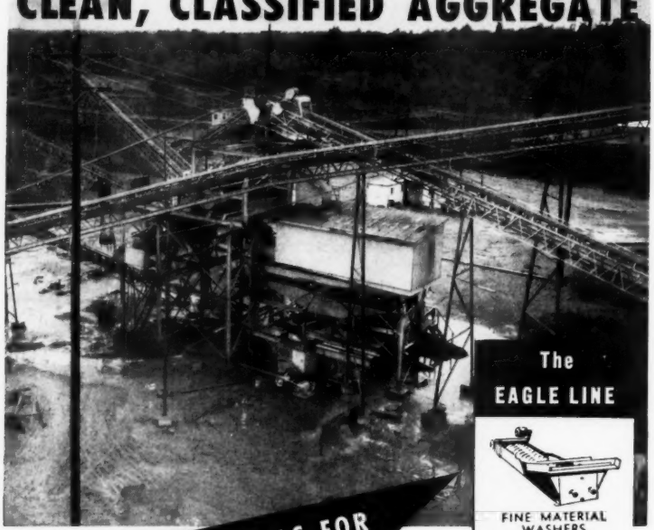

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Concrete Forming Engineers

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muck and the frequent requirement of filling all spaces outside the lining.

The blast is fired from the top, after all men and equipment are out of the shaft, except that in very deep work some equipment might be merely raised far enough to be out of immediate danger.

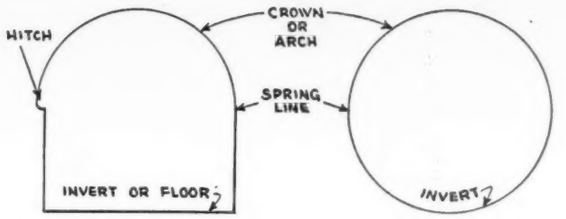
After the explosion, the bottom will be full of fumes, which would take a long time to dissipate naturally. These may be blown out by lowering the tool air lines with the ends open, or extending low-pressure ventilating ducts to the bottom. (These have to be dismantled or pulled back a considerable distance to avoid damage from the blast.) A suction line (foul-air duct) is more effective at cleaning the air than a blow or pressure line, as the fumes tend to settle.

Some shafts are large enough to provide space to load the muck by machinery, but in many of them it is tossed, rolled, or hand-shoveled into buckets or skips that are removed by the hoist when filled. The best fragmentation for this type of loading is usually one-man stone, that is, pieces that one man can handle conveniently.

Drilling can be resumed as soon as part of the bottom is cleared. Six or seven-foot steels giving a 5-foot penetration are often used, but longer or shorter ones may be better in particular circumstances. Hand and wagon drills are standard, although special jumbos have given good results.

When a large shaft is required as part of the finished job, but is not needed for the early tunnel work, it may be more economically cut from below. With this method the blasted rock falls to the tunnel floor and is removed through the portal.

The glory hole method involves sinking a small pilot shaft to the tunnel, then digging the large shaft from above, blasting or pushing the muck into the small shaft so that it will fall to the tunnel.



Tunnel cross sections.

Shaft lining

In soft ground the shaft is protected from caving by setting sheeting planks or sheet piling, held by walers, in much the same way described earlier for ditches and cellars. The walers are interlocked at the corners to hold each other in position, and additional divider beams may be run across between the ladderway and the hoist way.

If the soft soil is too deep to be held by sheeting driven from the top, successive layers can be driven from inside the shaft, inside the upper ones. If the sheeting is driven with an outward batter, shaft size will be preserved. If driven straight, the inside diameter of the shaft will decrease, so that the top would have to be oversize to allow it to be full size at the bottom.

Shaft lining or timbering is required for the hoist and to a less extent for the utilities, even when the soil or rock is self-supporting. When not needed for wall support, timbering may follow 20 or more feet behind the digging, to avoid interference with the work and damage to the lower section in blasts.

The lining must be supported vertically to prevent it from slipping down.

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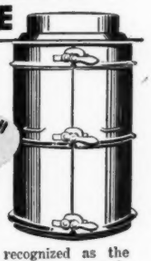

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Uni-Form Panels will form straight, irregular, curved, battered walls . . . slabs, beams, columns, piers—everything from small house foundations to massive concrete structures.

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The Uni-Form Panel System is complete, ready to use when it reaches the job. Eliminates field fabrication. Result: FASTER JOB STARTS.

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Simple assembly of easy to handle panels increases productivity of labor. Form more contact area per man hour with Uni-Form Panels.

AUTOMATIC ACCURACY

Assembly of Panels with Uni-Form Ties furnished for any wall thickness insures automatically accurate forming. Tie positively locks and spreads panels. No measuring . . . no guesswork.

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You use less lumber in Uni-Forming. Steel-framed panels erect into a tight, rigid form requiring minimum alignment and bracing on 1 side only—regardless of height. Saves labor too.

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Less alignment and bracing lumber . . . fewer parts to remove means faster stripping, lower costs.

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Rugged steel frame designed for fast pouring, cradles and protects plywood edges . . . permits maximum re-usage of plywood (actually 50 times or more) before replacement is necessary. Minimum panel maintenance required . . . lower material costs.

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Universal's engineering staff and field engineers provide competent, specialized assistance, backed by over 40 years of experience in concrete forming.

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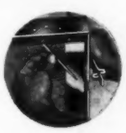
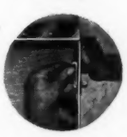
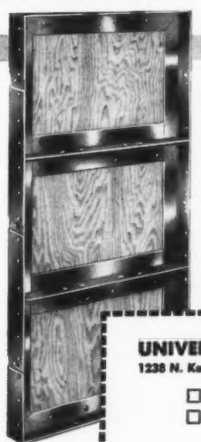
1. Insert Tie loop in Panel tie hole.



2. Tie Key locks Uni-Form Tie to Panel.



3. Tie loop receives adjacent Panel. Insertion of Tie Key completes tieing, locking and spreading operation.



3 BASIC ELEMENTS

UNI-FORM PANEL . . . Heavy duty — steel-framed, plywood faced.

UNI-FORM TIE . . . High strength, easy break-back.

UNI-FORM TIE KEY . . . Wedge shaped for fast, easy insertion and removal. Reusable.

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For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 380

Each new set is fastened by hanging bolts to that above, and every hundred feet or so horizontal notches or shelves are cut into the walls to provide fresh support.

Timbered shafts are usually rectangular, while metal or concrete linings call for circular cross section. Steel ribs are made up, curved to the proper arc, and divided into two or three pieces that are lowered endways and then supported by hanging bolts until fastened into a full circle. The actual lining or lagging may be sheet piling or similar material, or the ribs may be built as liner plates, with curved flanges which butt against those above and below to make a continuous sheet.

A continuous lining or lagging is used in soil that might squeeze between ribs or timbers, or in rock that scales or breaks off so that falling pieces would endanger workmen. Unlagged walls may often be kept intact by spraying with concrete or a bituminous mixture.

Most shafts are wet. If there is only a little water, it can be bailed into the bucket and hoisted with the muck. More often it is removed by a pump with a discharge line reaching to the surface or, if the height is great, to one or more pumps that help push the water out of the shaft. All pumps used in deep shaft work should be able to develop very high discharge pressures, so that a good lift can be obtained between boosters.

If water conditions are severe, the area may be predrained by sinking 4 to 12-inch holes with churn drills, and pumping from them. Depth is too great for ordinary wellpoint work from the surface, but in flowing ground wellpoints may be sunk from the shaft bottom or sides, and the water rehandled by the regular pumps.

A deep wet shaft should have gutters and sumps at intervals, to catch water running down the sides. Pumping to the top from intermediate points is more efficient than allowing water to get to the bottom, and raising it from there.

(To be continued next month)

Booklet compares parts

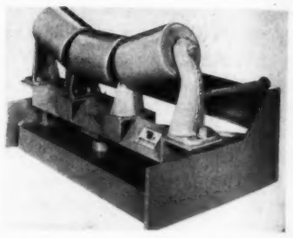
■ A Caterpillar booklet compares parts available from the machine manufacturer to those offered by other manufacturers whose salesmen sometimes describe their parts as being "just as good" as original parts. The literature attempts to show why typical parts offered by "substitute" manufacturers are not as good as those produced by the machine manufacturer.

To obtain Form DE591 write to Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 73.

Electronic "weighmaster" boasts greater accuracy

■ A new alloy, which is said to be unaffected by temperature changes through a range of some 200 degrees, is the key to a new robot weighmaster for conveyor belt systems many miles long.

Called Electro-Way and manufactured by the Bell Automation Corp.,



The Electro-Way "robot weighmaster" uses this electronic measuring equipment to weigh cement or aggregate on conveyor belts.

Division of Bell Aircraft Corp., the electronic device automatically weighs cement, aggregate, or similar materials as they pass by on the conveyor. In addition to recording quantities, it is said to prevent overloads, improper blending of ingredients, and choke-ups in mixing machines.

The principal advantage of the Electro-Way device over earlier, nonelectronic continuous-weighing devices is said to be its accuracy and versatility. It also is considerably lighter, smaller, and more compact. According to the manufacturer, the most important feature of the unit is its consistantly high accuracy despite sudden radical changes in load. Variations in belt loading between 5 and 100 per cent are said to have negligible effect on accuracy.

The Electro-Way's pick-up consists of one idler over which the loaded belt passes. The idler, in turn, bear upon the special-alloy spring. A "transducer" converts the spring's mechanical motion into an electrical signal. Simply mounted on the conveyor frame, the weighing platform requires no superstructure and no floor space.

The electronic measuring equipment, housed in a box about 2 cubic feet in volume, can be located remotely if desired. Measurements are displayed on a Veeder-Root or similar counter, recorded on a 24-hour chart, or both. The entire mechanism weighs only 350 pounds. Its power requirements are low—115 volts, 60 cycles, approximately 100 watts.

For further information write to the Bell Automation Corp., Division of Bell Aircraft Corp., 749 Monroe Ave., Rochester, N. Y., or use the Request Card at page 18. Circle No. 114.

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NEW Super Portable Rotary • RP900DA

Delivery, cfm	900
Control	*New* Simplified Thriftmeter
Length	13'9"
Width	6'9"
Height	8'5"
Turning Radius	18'
Weight, dry	12,790 lb.

NEW Super Rock Drill • DH143

Hammer Diameter	5½"
Drill Rod Size	1⅞" hex.
Weight, with crawler	10,500 lb.
Rod Change, up to	20'
Height, Mast at Vertical	29'
Length	11'
Width	8½'

NEW Gardner-Denver rock work team

Here's a new Gardner-Denver team for heavy-duty rock work in open cuts, in quarries, in open pit mines.

The new Gardner-Denver Rotary 900 Portable gives you extra air capacity for bigger drills or more of them —without additional engines and equipment to care for. Plus these popular Gardner-Denver features: clutch for easy cold-weather starting . . . circulating water system for warming up the compressor oil before it turns over . . . super-simplicity for easy field maintenance.

The new Gardner-Denver 5½" Model DH143 gives you an entirely new rock drill class. Now you can select the proper bit size and plan hole spacing for best breakage in any ground. All controls are conveniently mounted at the operator's station. Available with a new Gardner-Denver air-powered crawler, or for mounting on your own heavy diesel tractor.

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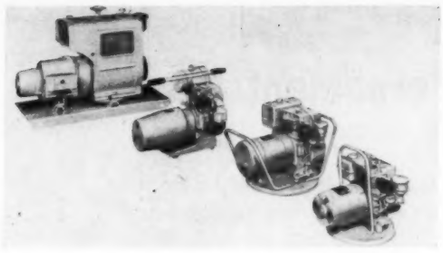
For more facts, use Reader-Reply Card opposite page 18 and circle No. 381

New portable generators range from 5 kw down

■ A generator for every use is the claim for the new 1956 line of portable gasoline-engine-driven generators introduced by Master Vibrator Co., Dayton, Ohio. The line-up includes eight new ac and dc models in 750-watt, 1,500-watt, 3-kw, and 5-kw capacities.

All the new models have direct-connected engine and generator, automatic pilot light, and inherent voltage regulation. They are shock-mounted for minimum vibration, and equipped with air-cooled engines and automatic governors. The 750 and 1,500-watt models are powered by Briggs & Stratton engines; the 3 and 5-kw models by Wisconsin engines.



New Master portable generators range in capacity from a 5-kw model (left) down to a 750-watt model (right).

Radio shielding is available on all models.

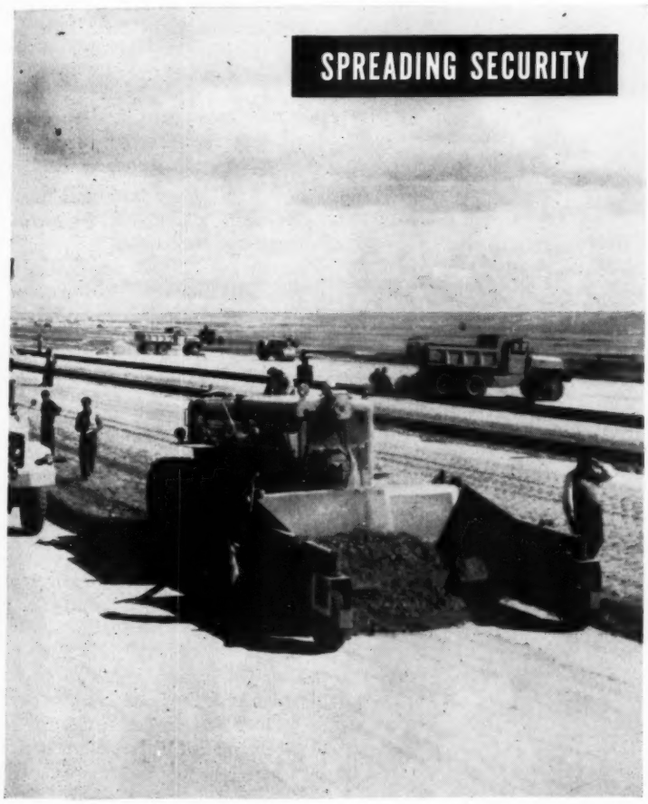
These Master generators weigh as little as 69 pounds (750-watt model), and all lightweight units have handles for easy carrying. The 5-kw unit is mounted on a portable skid base for towing and lifting.

For further information write to Master Vibrator Co., 264 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 61.

Emulsions for concrete

■ The full line of Eziform emulsions, including wood, plastic, and metal forms coatings and concrete additives, is described in a booklet from the manufacturer. Descriptions, applications, and instructions for use of the compounds are included. Emulsions for making form stripping easier and more efficient, for cleaning all equipment that comes in contact with concrete, for cleaning concrete surfaces, for the prevention of adhesion of concrete to metal and other materials, and as an air-entraining agent are discussed.

To obtain this booklet write to Eziform, Inc., 6021 W. 31st St., Cicero, Ill., or use the Request Card at page 18. Circle No. 166.



JOB: Torrejon Air Base, Madrid, Spain
CONTRACTOR: Brown-Raymond-Walsh

Photo By: William H. Greene

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A revival in building ornamentation?

Changing tastes and rising costs leave only a handful of artisans with ornamental-plastering "know how"

Ornamental work on buildings—long thought to be on the verge of extinction as the result of the move toward functionalism—may be on the way to a new, though restrained, revival in building construction.

The trend back to molded plastering, according to John T. McKeown, president of McKeown Plastering Co. the Bronx, N. Y., and the Employing Plasterers, has been evident for the past six years. Current work, McKeown declares, "is flatter and not so heavy as the 1900 styles, nor so ornate as the 19th century styles, but it is just as intricate." As an example of the modern use of ornamental plastering, he cites the St. Martin of Tours School, recently completed in Bethpage, Long Island, N. Y., for which his firm did 14 different "molds" of ornamental plaster.

Perhaps the reason for a return to this work—should it assume importance—lies in a turning away from the severe, unrelieved buildings characteristic of past years. Or perhaps the reason lies in the current activity of the plastering contractors.

Aware that they are in a highly competitive market and that they may be priced out of the field by cheaper plaster substitutes, the contractors are voluntarily contributing three cents per hour of work they perform to a special fund to publicize plastering and the plastering industry.

More significant is the fact that a night school has been opened to train apprentices, who must attend two nights a week for two years, studying ornamental-plaster mold making, layout planning, and installation. Previously, it took about five years to learn the business—a lengthy time to study work that may not be in demand at all times. One authority in the field declared flatly that he knows only about 18 men in the New York metropolitan area who are qualified to execute anything more involved than a simple plaster molding, and that there is no one in the U. S. who can do sgraffito.

Lost arts?

There is general agreement among building trade representatives that sgraffito is extinct, and that only an occasional architect, contractor, or plasterer even knows what the word means.

Sgraffito, which means a scratched ornament and is said to be the oldest form of surface decoration, involves placing patches of colored plaster on a base coat and covering them with a finish coat. The finish is then carved away to create the design. Another method involves spreading layers of plaster of different colors on top of each other between the base and finish coat, then carving down to the desired color.

Though ornamental plastering is centuries old, the modern technique dates from the mid-1800's, when a patent was granted to produce ornaments with plaster, glue, wood, wire, and canvas or woven fabrics.

Work done by hand

Ornamental plastering is done entirely by hand. Almost invariably, a single project requires a variety of ornaments—moldings, progressively diminishing units for a vaulted ceiling or church apse, a medallion, a decorative cap around a column—each of which is different. The duplicates or "repeats" required are so few that they can be done by hand at less cost than if equipment were designed for the decoration.

In producing an ornamental plaster

ALL WELD and a YARD WIDE

...That's YAUN'S 2½ YD. BUCKET

ALL Yaun products are ALL-WELDED, for more strength, with less dead weight. Typical of Yaun's complete bucket line is the 2½ yard clamshell shown. Weld #1, 3 yards long, is Manganese hard surfacing, to keep the cutting lip smooth and sharp for bite after bite, job after job, year after year. All Yaun buckets, drag or clam, have Manganese steel wherever they hit the load; they dig and dump fast and clean, and have long useful life.

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FRONT TO BACK
TOP TO BOTTOM
SLOPING FLOOR

YAUN MAKES
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CLAMSHELL BUCKETS
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IN ALL SIZES

YAUN MANUFACTURING CO. BATON ROUGE, LOUISIANA

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◄ The call for ornamental plastering was already declining when this 15 x 6-foot panel, one of a series of 20 in the lobby of New York's Vanderbilt Hotel, was executed in 1911. William L. Crow Construction Co. built the hotel.

figure, the architect provides the molder with a scale drawing of the subject desired. Each design is first modeled full size in clay. Only one model is required even if the design is to be repeated, since a number of designs can be cast from a single mold.

Designs fall into four styles—Gothic, Renaissance, English, and Romanesque. A fifth style, French or "the Louis styles" is not used any more. "Running" ornamentation such as moldings is modeled in a unit length of about a foot.

Hot gelatine poured over the full-size clay model forms a mold from which the required number of ornaments or "repeats" are cast in plaster. The final step sees the plaster ornament affixed to a ceiling, wall, or pillar with ornamental gum.

Light plaster ornaments, weighing up to about five pounds, can be affixed without backing. Heavier units are backed with burlap, while designs weighing 20 pounds or more are cast around a framework of wood or metal and fastened to the framework of the building. In all cases, the ornamental plaster figure or design becomes a member of the structure rather than a decoration.

Decline since 1900

The decline in ornamental plastering set in at the turn of the century when the idea that form should follow function began to gain popularity in building circles. Prior to that time homes like the Pratt Mansion in Brooklyn, clubs, and public buildings were never without it, and more important projects were designed and executed on commission by well known artists and sculptors of the day.

"One of the most graceful examples of such a commission," according to William L. Crow, head of the William L. Crow Construction Co., in New York City, "is in the lobby of the Vanderbilt Hotel at Park Avenue and Thirty-Fourth Street." The structure, built by the Crow firm in 1911, has a series of twenty panels in the lobby, each of which is about 15 feet long and six feet high, showing children romping with various animals. The panels were designed by the late Mrs. William Astor Chandler, a well-known sculptress of the time.

The work on these panels was done as the heyday of ornamental plastering drew to a close. A number of factors contributed to the slacking off in this kind of work, according to Crow:

"After World War I, the rise in plasterers' wages, and the growing scarcity of skilled workmen were some of the more important factors leading to a considerable increase in the use of substitutes for plaster work. Then came the trend to modernism, streamlining, and functionalism in architecture. The essence of this was simplicity, and the

(*Concluded on next page*)

write for further information
Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

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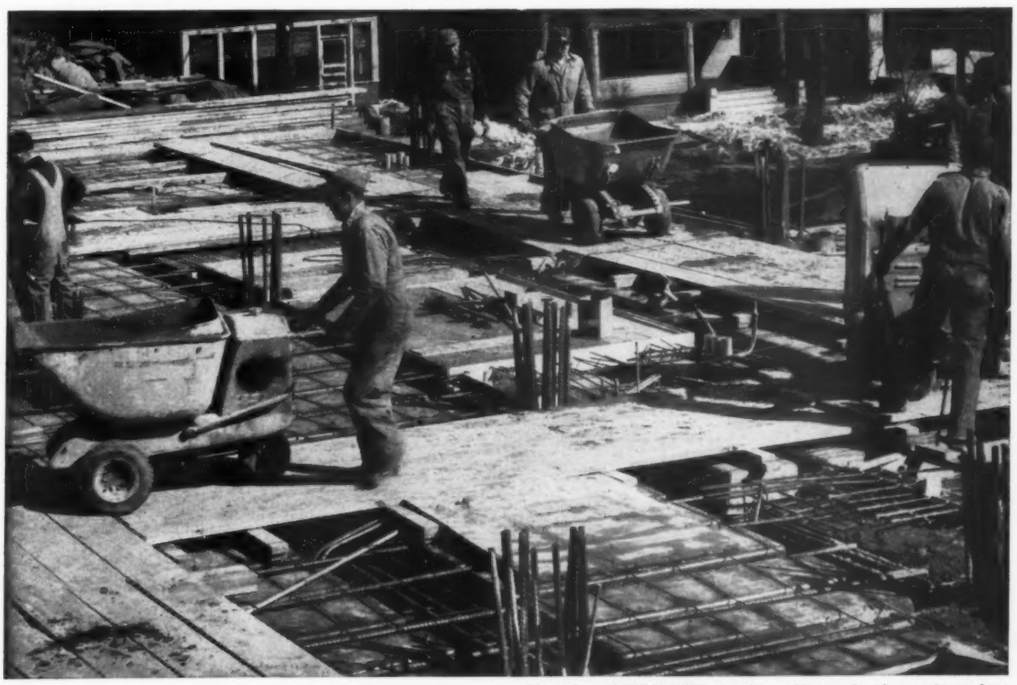

These three PRIME-MOVERS placed over 50 cu. yds. of concrete per hour

Here is the proven practical way to cut construction costs immediately!

Contractors switch to labor-saving PRIME-MOVER without complicated job preparation or set-up.

NOW, many contractors use a PRIME-MOVER when there is concrete to place — bricks to haul — materials to move.

The PRIME-MOVER is narrower than hand buggies and only six inches longer. One man with a PRIME-MOVER will place 12 to 17 cu. yds. of concrete per hour, or haul up to 300 brick per trip.

PRIME-MOVER has a dump bucket and a flatbed that interchange in seconds without tools. Powered by a dependable engine. The transmission requires a minimum of maintenance. PRIME-MOVER is stocked, serviced, and sold by leading distributors throughout the United States and Canada.

Write for job information and estimators performance data — and literature on the newest PRIME-MOVER, the Model 15A.

PRIME-MOVER pouring concrete from bucket

PRIME-MOVER hauling tile on flatbed

PRIME-MOVER

THE PRIME-MOVER CO., MUSCATINE, IOWA

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elimination of everything that was not absolutely necessary. And one of the first casualties was ornamental plastering."

Though it is doubtful if ornamental plastering will ever be used as profusely as it was fifty or more years ago, it is not entirely dead. Such work was used in the new headquarters for the Seamen's Bank for Savings, which the Crow firm built recently on the site of the old U. S. Assay Office at 30 Wall Street. The decoration here was limited to a few medallions and simple moldings. The most elaborate work was done on a molding in the form of a rope, the symbol of the bank.

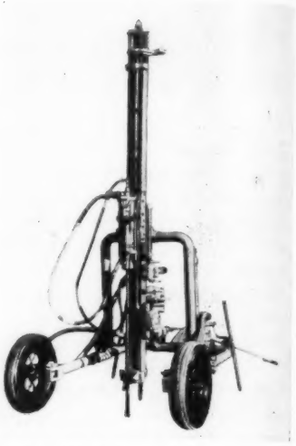
Julian Holland, a retired associate of the architectural firm of Warren & Wetmore, which designed the Vanderbilt Hotel, Grand Central Terminal, and a number of hotels in the Grand Central area of New York City, feels that ornamental plaster will not be neglected in modern architecture. He says, "It may not always be the same as it used to be—or even remain as it is today—but I think that if you keep in mind the fact that 'modern' architecture strives for simple treatment without cost, you can understand the direction in which it is moving."

Such 'simple treatment' might be illustrated in rooms of the two dormitories recently completed for Pratt Institute in Brooklyn. Here, according to Crow, "the otherwise stark bareness of the plaster walls is relieved by an indented line running around the walls about six inches below the ceiling." With this, the architect, McKim, Mead & White, achieved the effect of a narrow molding.

Until the resurgence of ornamental work—if this should occur—the almost lost art is being used principally for churches in the U. S. and abroad. One of the most intricate problems in ornamental plastering for churches lies in calculating the progressive reduction for apses and vaulted ceilings. These, being built mainly in Italy and Spain, are a specialty of Italian artisans who travel all over the world to execute the work. Yet even the more or less traditional work on churches today is making concessions to modern designs, for ornamental plaster features are being planned so that they will not interfere with sound travel. THE END

Two new wagon drills have automatic controls

■ Two new air-driven wagon drills, featuring fully automatic controls grouped conveniently on a motor



The Thor BW-2 heavy-duty wagon drill.

which can be repositioned along the mast, have been announced by the Thor Power Tool Co. The SW-1 is a general-purpose model and the BW-2 is a heavy-duty unit.

The BW-2 heavy-duty wagon drill has been extensively redesigned and improved to replace the old BW-1 unit. Built around the company's powerful Model 105 drifter, the new rig incorporates a newly designed mast with improved chain tension adjustments and advanced shock absorbers. The manufacturer states that the new design will prove especially effective when the drifter is under rapid traverse to the mast top for a new drilling cycle.

The BW-2 can be used with Thor's Model 82 or 92 drifters as well as with the 105 drifter unit. With any of these drifters, the mast alone is available as a separate unit for operation on a

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"quarry bar", or in tandem mounting for pipeline drilling.

The new mast has grouped, movable controls including lever-operated blower control and a motor feed control with infinitely variable feed ranging from 2 inches per minute to full speed for fast return or approach. The chassis has a re-designed hand crank for raising or lowering the mast, and a positive 90-degree wheel lock for line drilling.

The SW-1 wagon drill mounts either a Thor 75 or 77 sinker rock drill or a Thor 82 or 92 drifter. It is equipped with a saddle and cone permitting mast adjustment for drilling holes through a full 360-degrees in all directions. The chassis "collapses", by means of a worm drive for drilling at various levels down to extremely low positions for snake or lifter holes.

For further information write to the Thor Power Tool Co., 175 N. State St., Aurora, Ill., or use the Request Card that is bound in at page 18. Circle No. 131.

Crawler-mounted pipebooms

■ Superior Equipment's pipebooms for mounting on the International TD-24 crawler tractor are detailed in a catalog from the firm. Individual drum shafts, safety cable shield, drum brakes, rear-power takeoff clutch, drum clutches, and automatic boom power throw-out are pictured. According to the specification chart, the PBI-24BH unit with bottom-hinged hydraulically extended counterweights lifts loads up to 110,000 pounds, while the PBI-24C with top-hinged weights has load capacities up to 90,000 pounds.

To obtain this catalog write to Superior Equipment Co., P. O. Box 30, Bucyrus, Ohio, or use the Request Card that is bound in at page 18. Circle No. 36.

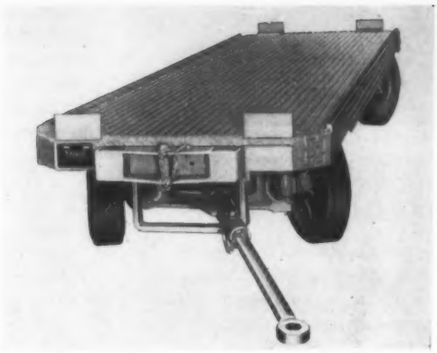
Hitch, greater length features of new trailer

■ The Yale & Towne Mfg. Co. has anounced a new standard 8,000-pound-capacity trailer. Features of the unit are longer length, with resultant increased carrying area, and an improved hitch.

The new trailer has a one-piece checkered steel-plate carrying platform 128 inches in length, and an over-all length of 135⅜ inches. It is available in platform widths of 38 or 48 inches. A steel-bound sturdy oak platform is also available.

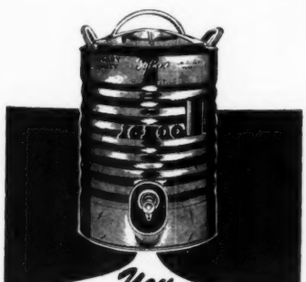
The new Yale trailer hitch is a simplified device which is connected or disconnected on either end of the trailer by the removal of a single pin.

Like other units in the Yale line, the new 8,000-pound model has four-wheel steer accomplished through levers and connecting rods. This feature is said to assure perfect trailing regardless of the number of trailers.



The new Yale 8,000 trailer features a simplified hitch.

For further information write to The Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa., or use the Request Card at page 18. Circle No. 65.



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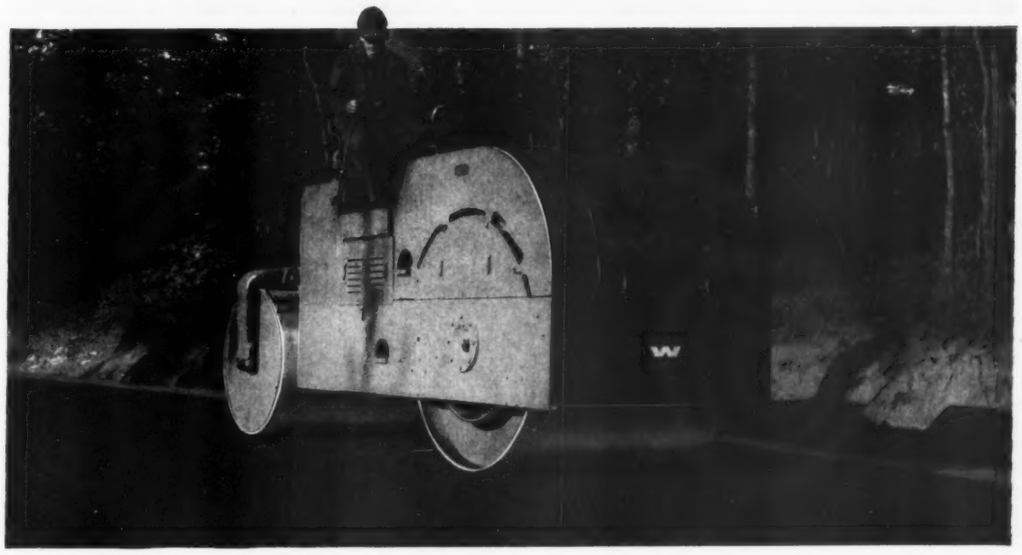

Two new important features added to Huber-Warco medium and large sized tandem rollers are: a torque converter and a two-speed transmission.

The torque converter offers all of the advantages of a fluid coupling, with these important plus features: (a) available power is doubled, (b) the roller maintains approximate rolling speed regardless of grades encountered, and (c) fuel consumption is reduced.

Advantages of the two-speed transmission are: (a) at slow rolling speeds, the use of low gear maintains sufficient RPMs at tailshaft to keep governor effective, (b) makes correct gear ratio available to meet any work load or desired rolling speed, thus reducing strain on converter and engine, and (c) allows the engine to maintain sufficient RPMs to provide hydraulic pressure for fast steering at low rolling speeds.

Other important Huber-Warco features include: the exclusive guide roll assembly that will not "scuff" (factory perfect adjustment for the life of the roller); full hydraulic steering with variable speed adjustment; two braking systems; dual controls; close curb clearance and many other features that make the Huber-Warco tandem line outstanding.

Huber-Warco medium and large sized tandems are gasoline and diesel powered and are available in 5-8, 8-10, 8-12 and 10-14 ton models. A 3-5 ton tandem with water cooled engine and torque converter as standard equipment, is also available.

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avoid legal pitfalls

Liability for injury to children at play

THE PROBLEM: *A construction company stored equipment and material on a city lot, knowing that children habitually played there. An 8-year old boy dropped a lighted match into one of the vents of an old and unused petroleum tank that was lying on the ground. He was injured in the explosion that followed. Was the company liable?*

THE ANSWER: Yes. (Gatlinburg Construction Co. v. McKinney, 263 S. W. 2d 765, decided by the Tennessee Court of Appeals, Eastern Section.)

The implied assent of the company to use of the lot as a playground was emphasized by the fact that the children had erected a basketball court there, but it was enough that the company's representatives knew that children played there. This made the company negligent in omitting to steam the tank, seal the vents or otherwise guard against the possibility of an accident.

A decision rendered by the Louisiana Supreme Court in the case of Jackson v. Jones, 69 So. 2d 729, shows how a contractor may render himself liable for injury to a child on another legal theory—that the contractor has negligently maintained an "attractive nuisance." (One of the most common examples is found in the leaving of heavy equipment outside working hours on a street or vacant lot in such condition that a trespassing child can easily set it or its mechanism in motion.)

In the Louisiana case, a contractor engaged in constructing a gymnasium on a schoolground stacked lumber in the playground in such a way that children were able to play on top of the pile. One of the children fell upon a protruding nail and was injured. The court said that the contractor was not free from liability because he and the school principal had agreed that it would be better for the principal to warn the pupils to stay away from the lumber pile than for the contractor to construct a barricade around the material. The contractor's responsibility for making the pile safe could not be avoided by relying upon the principal to keep the children away.

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Suit on performance bond is judged as premature

THE PROBLEM: *A municipal-sewer contractor did not complete his contract, but the six-month period in which the municipality had first right to sue on the bond had not expired. Under Mississippi law, was a creditor's suit against the performance bond premature?*

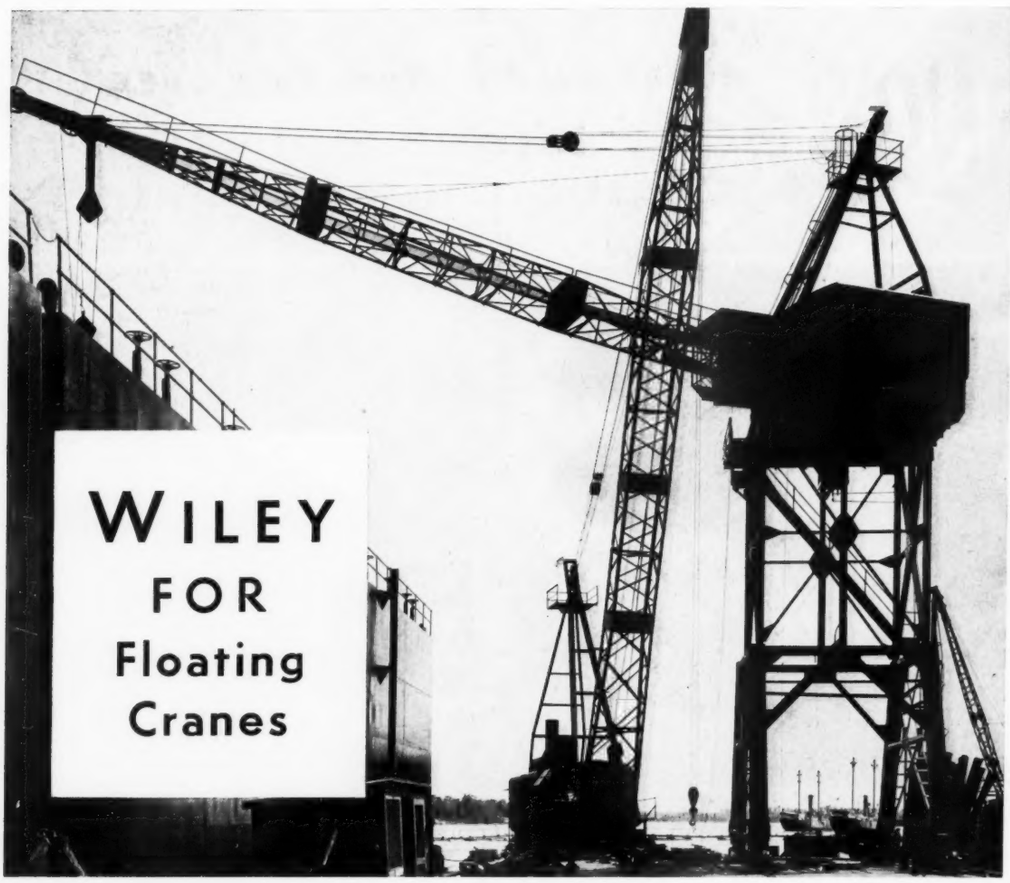
THE ANSWER: Yes. (Walker Construction Co. v. Construction Machinery Corp., 77 So. 2d, decided by the Mississippi Supreme Court.)

Defective scaffolding

THE PROBLEM: *Under New York law, was a general contractor liable to a masonry subcontractor's employee for an injury caused by defective scaffolding selected by the subcontractor?*

THE ANSWER: No. (Gambella v. John A. Johnson & Sons, 140 N. Y. Supp. 2d 208, decided by the New York Supreme Court, Appellate Division, Second Department.)

The court said that it made no difference that the general contractor was aware that the workman was using the scaffold, the highest court



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of the state having decided that a general contractor is not bound to protect the employees of subcontractors against the negligence of their employers. (Broderick v. Cauldwell-Wingate Co., 301 N. Y. 182, 187, 93 N. E. 2d 629, 631.)

In the Gambella case it was an important factor that the general contractor had not directed the injured man to go upon the scaffold. Also important was the point that the scaffold did not constitute a "place of work" furnished by the general contractor which, under the New York Labor Law, a general contractor must keep in reasonably safe condition.

Official's private interest in contract

THE PROBLEM: *One North Dakota statute makes it a misdemeanor for any "public officer" whose official duties include making contracts, to become individually interested in such a contract. Another statute provides for removal from office of any "township board member" who becomes interested in a contract awarded by the board. By implication, does the latter statute provide the only penalty against a member of a township board who becomes personally interested in a public contract?*

THE ANSWER: No. (State of North Dakota v. Pyle, 71 N. W. 2d 342, decided by the North Dakota Supreme Court.)

A defendant unsuccessfully sought to have his conviction for interest in a township road-grading contract set aside, arguing that removal from office was the exclusive penalty that could be inflicted on him. The contract had been awarded by a board of which he was a member.

Contractor not liable for injury to careless driver

THE PROBLEM: *A motorist drove on a detour bridge at 25 mph, knowing that the approaches were slick with tar and that clay, washed onto the bridge by rainfall would render driving dangerous. His car went out of control and overturned. Was the construction contractor liable in damages?*

THE ANSWER: No. (James v. Smith, 88 S. E. 2d 179, decided by the Georgia Court of Appeals.)

The court said that the motorist was "the author of his own misfortune."

Damages are allowed for illegal picketing

THE PROBLEM: *In a suit by a state highway contractor against an operating engineers union and other unions, the courts decided that the defendants had engaged in illegal picketing resulting in stoppage of the use of heavy equipment, a violation of the Colorado Labor Peace Act. Were the contractor's damages properly measured by the rental value of the machines while they were out of use, as distinguished from loss of profits on the entire contract?*

THE ANSWER: Yes. (Denver Build-

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ing and Construction Trades Council v. Shore, 287 Pac. 2d 267, decided by the Colorado Supreme Court.)

Rejecting the union's contention that loss of profits attributable to the unlawful picketing was the proper measure of damage, the Supreme Court said: "It is impossible to allocate to each of several heavy machines on the job the proportion of the over-all profit attributable to the agency of each thereof. Apparently for this reason the rule has generally been adopted that where through unlawful or wrongful acts of defendants heavy equipment has been kept idle and the work expected to be accomplished thereby delayed, the fair rental value of such equipment during the period of prevention of its use is generally adopted as a proper measure for determination of the extent of damage."

Mutual mistake made agreement invalid

THE PROBLEM: *A gravel-haulage contract was made under mistaken belief of both parties that gravel specified for a road project was obtainable on government land across which the road was to be constructed. Was the haulage contractor entitled to damages from the road contractor because he had been prevented from carrying out the haulage contract?*

THE ANSWER: No. (Petrey v. John F. Buckner & Sons, 280 S. W. 2d 641, decided by the Texas Court of Civil Appeals, Waco.)

The court said that the case fell within the general rule of law that both parties are free from liability to carry out a contract that has been made under mutual mistake regarding the existence of a condition that is of vital importance.

Surety is liable for default of subcontractor

THE PROBLEM: *A subcontract called for earth removal on a building-construction site. Shortly after work began, shovel operators were ordered off the job by a union with which the subcontractor had no contract. (1) Was the prime contractor entitled to default the subcontractor, complete the work, and hold the subcontractor's surety liable for the cost of completion over the contract price? (2) The subcontract did not specify how rock should be blasted, but it was later agreed that the unit price should be increased from $4 to $8 if the subcontractor used the trench-rock method rather than a shaft-rock method. Did that constitute such modification of the contract without the surety's consent as to release the surety? (3) Breakdown of items under the subcontract concerned internal pay control only. Was it necessary to secure the surety's consent to departures from the method, if the surety's rights were not affected? (4) Since the surety was liable in the full sum of the bond, was it also liable for interest and costs accruing through litigation as to its liability?*

THE ANSWERS: (1) Yes. (2) No. (3) No. (4) Yes. (Veneto v. McCloskey & Co., 128 N. E. 2d 337, decided by the Massachusetts Supreme Judicial Court.)

Malicious damage claim is refuted in court

THE PROBLEM: *An Oklahoman sued for actual damages and for punitive damages allegedly caused by malicious damage to his land by the defendant, a sewer contractor. Was the contractor properly permitted to show that the sewer trench was hand-excavated, thereby causing less damage than if a machine had been used and indicating lack of malice?*

THE ANSWER: Yes. (Ruland v. Zenith Construction Co., 283 Pac. 2d 54, decided by the Oklahoma Supreme Court.)

The court decided that a jury had properly limited an award in the landowner's favor to $50, actual damages.

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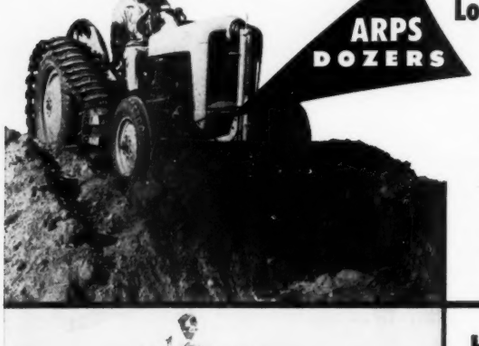
Our new film "The Warning Shadow" will tell you what every man should know about lung cancer. To find where and when you can see this film, and to get life-saving facts about other forms of cancer, phone the American Cancer Society office nearest you or simply write to "Cancer"—in care of your local Post Office.

American Cancer Society



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New text on concrete materials and methods

"Concrete Materials and Practice," by L. J. Murdock, discusses the science of making concrete, with particular attention to the translation of theoretical knowledge into actual practice for field work. The basic materials and the technique of concrete making under various conditions are discussed in detail.

Methods of testing, design of the mixes, and methods of control of the quality at the site are also included. Brief mention is made of the design of reinforced concrete. Incorporating advances made in the last few years, the text also treats of admixtures and the practical aspects of prestressed concrete.

Well illustrated with photographs, charts, and diagrams, the book is available from the publisher, Edward Arnold, Ltd., 41 Maddox St., London, England.

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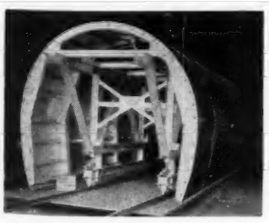

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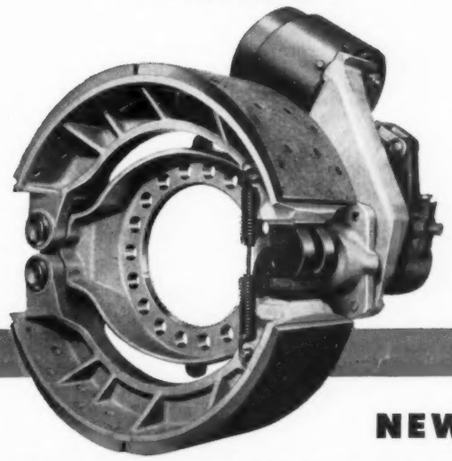


Better control for the "heavyweights"

NEW TIMKEN-DETROIT®
HEAVY-DUTY "P" SERIES POWER BRAKES

No earth mover is any better than its brakes. Dependable control is indispensable on *all* big construction vehicles. So it's important that manufacturers specify brakes that are large enough, safe and durable. No contractor can afford to have essential earth moving equipment side-lined because of brake problems.

Now! Timken-Detroit Brake Division offers the new Heavy-Duty "P" Series Brakes to give manufacturers greater dependability . . . *better* control . . . and *longer* service.

The "P" Series Brake utilizes a unit-mounted design that offers a self-contained, compact assembly. Camshaft and air chamber support brackets are mounted directly onto the brake spider. (Inboard chamber mounting design is also available.)

Temperatures during operation are lower and liner life is longer because of the open-type spiders which assure good internal ventilation and rapid cooling. Timken® ¾" "Econo-liners" are tapered to provide greatest thickness where most wear occurs . . . less waste material at reline.

Other features of new "P" Series Brakes: heat-treated, malleable iron brake shoes . . . securely riveted brake linings . . . constant lift S-type, heat-treated cam . . . sealed, needle bearing camshaft mountings . . . long-life bronze bushings in anchor-pin holes . . . hardened, rust-proofed anchor pins.

"P" Series Brakes are available in a complete range of capacities and sizes to fit every operating requirement. For expert consultation, contact Timken-Detroit Brake Division. Complete specifications and information on "P" Series Brakes are available. And a staff of experienced engineers is ready to assist you with any problem you may encounter.

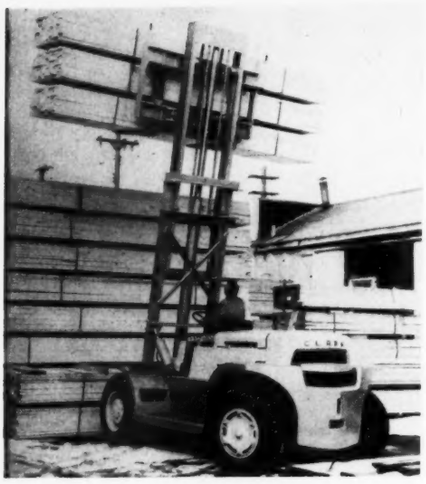
TIMKEN Detroit BRAKES
ROCKWELL SPRING AND AXLE COMPANY
Accepted TDA Standard

©1956, R S & A Company

For every industrial, agricultural or automotive application where braking is required!

TDA plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 400



Clark's new YL-150 fork truck lifts a 15,000-pound load of lumber or any other building material.

Fork-lift truck with 15,000-pound capacity handles pipe, lumber, other heavy materials

■ A new 15,000-pound capacity, dual-wheel-drive, pneumatic-tire fork truck designed specifically for outside heavy material-handling work has been introduced by the Industrial Truck Division of Clark Equipment Co. The new YL-150 has a full-load road speed of 20 mph, 30 per cent gradeability, and lift speed of 50 fpm.

The new unit is recommended for use by contractors in handling pipe, lumber, steel, and other building materials.

According to the manufacturer, mobility and ease of handling through heavy mud and snow result from three features: a Hercules JXC gas engine of 282-cubic-inch displacement, largest in this class of fork trucks; a design which puts at least 50 per cent of the machine's weight on the front axle; and 9 inches under-clearance beneath the uprights.

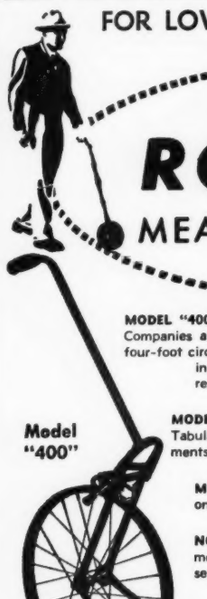
Uniformly controlled high-speed power steering is standard on the YL-150. Said to be an improvement

FOR LOW-COST, ACCURATE MEASURING

EMPLOY A

ROLATAPE

MEASURING WHEEL!



Model "400"

MODEL "400" This Model is a favorite and is widely used by Telephone Companies and other Utilities, paving contractors, land appraisers, etc. It's four-foot circumference measuring wheel makes it most suitable for measuring fairly rough terrain. Automatic measuring counter can be reset at any distance. Folds compactly.

MODEL "200" A popular Model for interior and exterior use. Tabulates wall-to-wall, vertical, or a 101 other measuring assignments. Folds compactly for kit or glove compartment.

MODEL "600" For cross country acreage measurement and work on rougher terrain.

NOTE—All Rolatape Models are designed to tabulate accurate measurements, and are constructed for long and dependable service. With Rolatape, you measure as you walk.

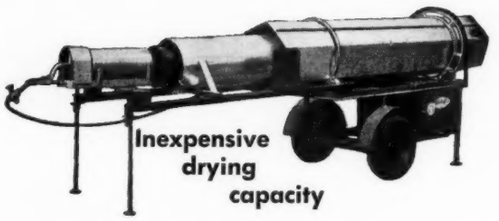
FOR COMPLETE ROLATAPE INFORMATION AND PRICES PLEASE WRITE

ROLATAPE, INC.
1741 14th Street, Santa Monica, Calif.
OR SEE YOUR LOCAL DEALER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 401

TARCO

Flash Flame **DRYER**



Inexpensive drying capacity

Here's a sturdy, mobile, job-tested *rotary-type* dryer. The Flash Flame dries stone, sand, gravel, slag, metal shot, sludge . . . pasteurizes soil, peat, vermiculite . . . all a lot Faster and Cheaper than you can imagine. Any one of your unskilled workers can have a Flash Flame Dryer turning out hot, dry material in 10 minutes . . . right on the job!

The Tarco Flash Dryer is the answer to your drying problems. Get all the facts from your nearest TARCO Dealer . . . or write to us.

TARRANT MFG. CO.

31 JUMEL PL., SARATOGA SPRINGS, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 403

New TELESCOPING **VIBRATORY SCREED**

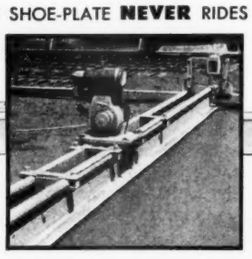
ITS SHOE-PLATE **NEVER** RIDES THE FORMS

Pats. Applied For

BUILT ESPECIALLY for

Overpass and Bridge Roadways

Tilt-Up Slabs and Industrial Floors



3,600 to 10,200 Vibrations per Min.

The Cmetco Telescoping Vibratory Screed is a radically new piece of cement finishing equipment. It has been engineered to economically solve many of the problems confronting the larger contractors. Costs per cubic yard per man-hour are appreciably reduced. Cost for screeding equipment is less. Better depth compaction is another valuable feature.

Due to its fast telescoping feature it avoids the cost of auxiliary beams. Because it has no beam overhang it can be operated close to existing walls. Forms are protected because the telescoping feature adjusts shoe-plate length to form widths; to fractions of inches if necessary.

- **UNSURPASSED FOR DEPTH COMPACTION**
- **RE-TRANSMITTED VIBRATION AVOIDS DEAD SPOTS**
- **CONTROLS ITS OWN PILE-UP**
- **HANDLES MORE CUBIC YARDS PER MAN-HOUR**
- **QUICKLY ADJUSTABLE LENGTH AND HEIGHT**

. . . . . WRITE FOR CATALOGS

LENGTH ADJUSTMENT
• MODEL 302 From 15'-6" to 36'-0"
• MODEL 304 From 10'-2" to 25'-0"
HEIGHT ADJUSTMENT
From ½" below to 1¼" above top of forms
EASTERN REPRESENTATIVE
Earl H. Pence 403 Oak Lane Baltimore, Md.

CM-15

BETTER EQUIPMENT FOR PLACING AND FINISHING CONCRETE

POWER BUGGIES • TELESCOPING VIBRATORY SCREEDS • ECONOMY VIBRATORY SCREEDS • ROLA PAVERS AND TRENCH BOXES • WOOD AND STEEL TILT-UP HARDWARE • BULL FLOATS • HOPPERS • BUCKETS • ELEPHANT TRUNKS AND CHUTES • TAMPERS • HAND CARTS

Pats. Applied For

cmetco Trade Mark

Product of

Creative Metals Corporation

1290 POWELL STREET *Phone* **OLympic 3-8300**

EMERYVILLE, CALIFORNIA

DISTRIBUTED IN THE WEST BY W. J. BURKE & COMPANY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 402

"Is it too late, Doctor?"

It's *not* too late for Americans who go to their doctors at the *first sign* of any one of cancer's 7 danger signals: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

Guard yourself against cancer. Phone the nearest office of the American Cancer Society or simply write to "Cancer."

American Cancer Society

For more facts, circle No. 404

over conventional power steering, this feature gives uniform steering characteristics regardless of speed. High-speed maneuvering with full load is safer, and maneuvering at slow speeds or while creeping is immediate and effortless, the company reports. Wheels can be turned from hard left to hard right in 5 seconds.

The YL-150 has an outside turning radius of only 160 inches, and a swing length of 189 inches. Uprights tilt 6 degrees forward and 10 degrees backward. One-piece forks are forged alloy steel.

The hydraulic pump is integral with the engine, thus eliminating periodic adjustment. The main pump drive is enclosed in the engine gear case and runs in oil. A hinged hood can be lifted from either side or simply removed for access to the engine. Removal of the counterweight is not necessary during maintenance work.

A synchromesh transmission provides five speeds in both forward and reverse. A planetary drive axle, similar to axles found on heavy-construction equipment, is used on the YL-150. Hydraulic 16×4 power brakes and a separate mechanical parking brake are standard.

General specifications of the YL-150 include: wheelbase, 112 inches; over-all length (less forks), 169 inches; over-all width, 96 inches; weight, 19,965 pounds. Tires are 9.00×20, with larger sizes optional.

For further information write to Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich., or use the Request Card at page 18. Circle No. 183.

Siding fasteners

■ Tuff-Tite fasteners for roofing and siding materials are described in a bulletin from Townsend Co. The literature claims that Tuff-Tite fasteners with assembled neoprene washers form a watertight seal for the application of roofing and siding of aluminum, galvanized or stainless steel, protected metal, Fiberglas, plastic, and insulated panels. The undercut in the one-piece metal head controls the flow of the assembled washer on concave or convex surfaces. Specifications, materials, and sizes are listed.

To obtain Bulletin TL-107 write to Townsend Co., P. O. Box 237-2, New Brighton, Pa., or use the Request Card at page 18. Circle No. 16.

Hydraulic loader

■ The Economobile 600 is featured in a folder from American Road Equipment Co. Action shots of the 35-hp unit point out that it can be used with a concrete hopper for pouring walls, columns, or floors, and for hoisting men and materials to heights up to 18 feet. Various attachments are pictured and described. Also included in the folder are details on a mortar hop and brick hop.

To obtain this folder write to American Road Equipment Co., 4302 N. 28th St., Omaha, Nebr., or use the Request Card that is bound in at page 18. Circle No. 40.

Batching plants

■ Three catalogs from the Noble Co. feature the firm's various models of cement and aggregate batching plants. One catalog is devoted to the Mobile batching plant. The remaining two detail the large and small capacity plants. Each catalog contains diagrams of the front, side, and general plan of each plant, as well as condensed specifications, job photos, diagrams of mixer installations, batch dumping cycles, and lists of accessories that are available.

To obtain these catalogs write to Noble Co., 1860 7th St., Oakland 20, Calif., or use the Request Card at page 18. Circle No. 100.

Syntron names salesman

Raymond Bruton has joined the Philadelphia sales staff of the Syntron Co., Homer City, Pa.

LIFT OBJECTS QUICKLY—SAFELY... ANY SHAPE OR SIZE!

with DOWNS SAFETY GRABS for Cranes and Hoists

PILE BAND PULLER

Now you can tailor your lifting equipment to "fit" any shape or size materials to be moved with Downs *Safety* Grabs. No matter what your hoists are handling — pipe, rails, drums, plate or structural steel, stone, timber, boxes or odd-shaped objects of any size — there's a Downs *Safety* Grab *designed for the job.*

RIPPING HOOK

Downs *Safety* Grabs give you faster, easier lifting . . . and they're *safety-engineered* to provide a wider safety factor than listed capacity ratings. They can't let go until you release the load — real protection for workers that improves morale.

BEAM TONGS

Write for FREE illustrated catalog 2008-B for complete information on every model — today!

PILE POINT & BAND

PILE PULLER

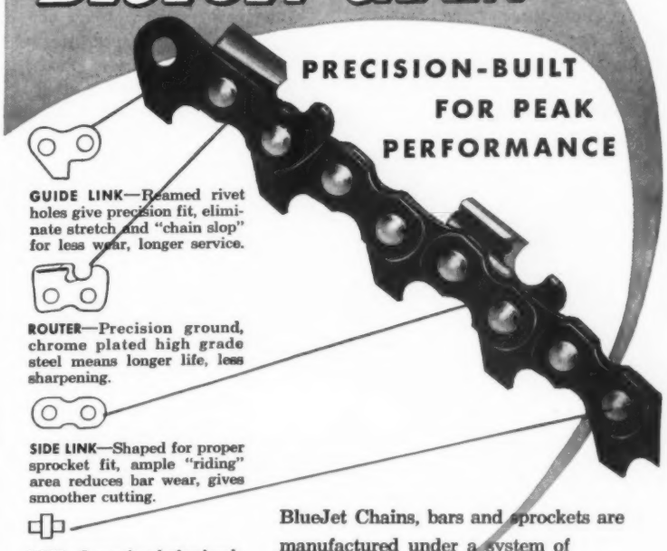
DOWNS "THE GRIP that NEVER GIVES"

DOWNS CRANE & HOIST CO.
MECHANICAL ENGINEERS
540 W. VERNON AVE. • LOS ANGELES 37, CALIF.

For more facts, circle No. 405

BLUE JET CHAIN

PRECISION-BUILT FOR PEAK PERFORMANCE



GUIDE LINK—Reamed rivet holes give precision fit, eliminate stretch and "chain slop" for less wear, longer service.

ROUTER—Precision ground, chrome plated high grade steel means longer life, less sharpening.

SIDE LINK—Shaped for proper sprocket fit, ample "riding" area reduces bar wear, gives smoother cutting.

RIVET—Large head plus hardened bearing surface helps maintain chain tightness, assures longer life.

BlueJet chains fit all popular saws, and there's a chain for every purpose. Falling, bucking, limbing, pond saws — BlueJet does every chain saw job better. Ask for our precision engineered bars and sprockets, too.

BlueJet Chains, bars and sprockets are manufactured under a system of rigid quality control. They are job-engineered and field-tested to give superior results and longer wear—with all makes of chain saws, in all types of cutting. You need peak performance—trouble-free and fast—in your chain saw. You get it when you specify BlueJet Chains.

BlueJet Chain Co. P16
2704 Fourth Avenue South
Seattle 4, Washington
Please send me literature on BlueJet Chains.
Name.....
Address..... City.....
BlueJet is the Universal Replacement Chain — a Precision Product for More Profitable Production

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 406

Brunner & Lay J-7.50 ROK-BITS

4½-in. Rok-Bit J-7.50 Coupling 4-in. Rok-Bit J-7.50 Thread 3½-in. Rok-Bit

Brunner & Lay J-7.50 Rok-Bits® designed to fit directly on J-7.50 threaded drill rods. No adapter needed. Additional air holes ensure better chip removal, so that bit does not work in its own cuttings. Let us show you by COMPETITIVE TEST what Rok-Bits can do to boost your output/ or yardage/ and safeguard profits. Write for bulletin.

Brunner & Lay Products

Brunner & Lay, Inc.
9300 King St.
Franklin Park, Ill.

Brunner & Lay Rock Bit of Philadelphia, Inc.
2514 E. Cumberland St.
Philadelphia 25, Pa.

Brunner & Lay of Los Angeles, Inc.
2425 East 37th St.
Los Angeles 58, Calif.

Brunner & Lay, Inc.
150 Leslie St., Dallas, Texas

Brunner & Lay Rock Bit of Asheville, Inc.
Sweeten Creek Rd., Asheville, N. C.

Brunner & Lay of Portland, Inc.
660 N. Tillamook St., Portland 12, Ore.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 407

manufacturer memos

New vice president elected by McKiernan-Terry Corp.

A new vice president and director of McKiernan-Terry Corp., G. Robert Compton, Jr.

G. Robert Compton, Jr., has been elected a vice president and director of McKiernan-Terry Corp., Dover, N. J., manufacturer of pile hammers. He joined the firm six years ago as an engineer, became assistant to the vice president in charge of the Pile Hammer Division a year later, and manager of the division's sales and service in 1955.

Other newly elected officers of the firm are Carl W. Shattuck, first vice president; and George W. Bartlett, Robert M. Fortune, and Herbert G. Dillion, vice presidents. Bartlett and A. F. Wilson were also named to the board of directors.

Timken names two officers

The board of directors of the Timken Roller Bearing Co., Canton, Ohio, has appointed H. E. Markley assistant to the president and George L. Deal, to the post of secretary and treasurer.

With the firm since 1938, Mr. Markley had been secretary since 1953. Deal, who has served Timken in several executive posts for the past 20 years, was treasurer of the firm prior to his present appointment.

T. B. Kennedy acquires Van Brush Mfg. plant

Complete ownership of the Van Brush Mfg. Co., Inc., Kansas City, Mo., has been acquired by Tom B. Kennedy, a partner in the firm for the past ten years. As executive president and director of the company, Mr. Kennedy will continue to direct sales promotion and advertising.

Tom B. Kennedy, new owner and executive president of Van Brush Mfg. Co., Inc.

Van Brush will continue its line of industrial brushes and brooms under its new ownership.

Gen. McAuliffe to head American Cyanamid group

Upon retirement from the U. S. Army, Gen. Anthony C. McAuliffe will join the American Cyanamid Co., New York, N. Y., as director of the firm's newly created engineering and construction division. The new division will have coordinate status with the operating and research divisions of the company.

Gen. McAuliffe will also serve as president of American Cyanamid's subsidiary, Chemican Construction Corp.

Allis-Chalmers names head of foreign office

Myron W. Rhoten has been appointed managing director of Allis-Chalmers Great Britain, Ltd., a wholly-owned subsidiary of Allis-Chalmers Mfg. Co. of Milwaukee, Wis. The British office is located in Essendine, England.

Mr. Rhoten, associated with the firm since 1938, had been European territory sales manager for the A-C tractor group at the time of his appointment. He succeeds E. J. Mercer, who has returned to the U. S. to become manager of the tractor group.

Frank G. Hough Co. names district representative

Ralph E. Zimmerman has been named district representative of the Frank G. Hough Co., Libertyville, Ill., manufacturer of Payloader tractor-shovels and tractors. Zimmerman will cover the states of New York and Pennsylvania, excluding the New York City and Philadelphia areas.

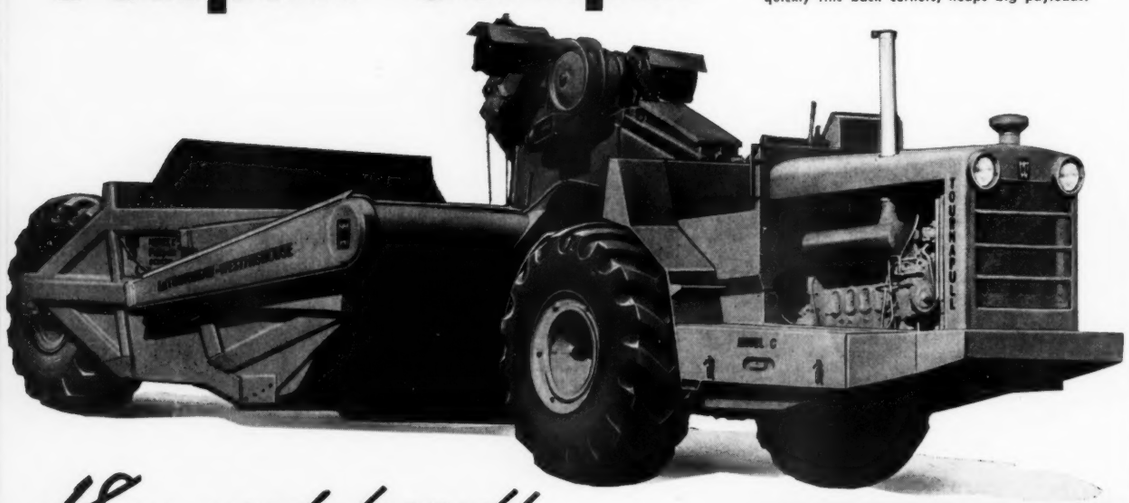
Pioneer Engineering names district representative

Robert J. Johnson has been appointed the new district representative for the New England States area by Pioneer Engineering Works, Minneapolis, Minn., a subsidiary of Poor & Co. of Chicago, Ill.

His territory will include the states of New York, Connecticut, Rhode Island, Massachusetts, Vermont, New

New Model C Fullpak Scraper

▲ Low, wide bowl of Fullpak Scraper with 9½′ blade gives live, boiling action that quickly fills back corners, heaps big payloads.



18 cu. yards heaped!

Loads faster... Boils better...

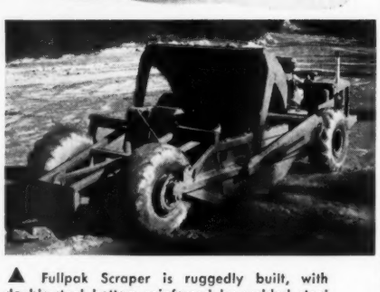
You've never seen a scraper that loads as *easy* and heaps as *fast* as this new LeTourneau-Westinghouse Model C Fullpak Scraper. Its low, wide bowl loads up to 18 cubic-yards heaped capacity with minimum loading resistance. Low push-block matches height of tractor push-plates. Direct-line application of power from pusher to blade, packs load in *fast*. Live, "boiling" action fills corners as well as apron.

On new Fullpak Scraper, wheels are inside cutting edge, for precision work next to banks and on slopes. Positive, forward ejection forces out sticky as well as dry material... wipes bowl clean each load. High apron lift (6′1″) permits all material to be unloaded quickly in accurate lifts to meet any requirements.

Powerful, improved 208 hp Model C Tournapull prime-mover has famous power-transfer differential that keeps pulling-traction on both drive wheels at all times... also geared king-pin power steer that can turn 90° and "walk" Tournapull out of loose materials that stall ordinary prime-movers. You have speeds to 30 mph, with choice of sliding-gear or constant-mesh transmission.

New, fast loading Fullpak Scraper means more pay-yards for you

Before you buy your next scraper, get full information on this new Fullpak 18-yard C Tournapull. Get details from your distributor.



▲ Fullpak Scraper is ruggedly built, with double-steel bottom reinforced by welded steel filler-channels. Box-beam construction reduces dead-weight, increases strength. Sturdy push-block (43″ x 16″) pushing directly to blade through scraper-bottom, maintains contact with pusher over rough ground.

Curved deflector-plate on top of tailgate, together with curved apron, give best boiling action for fast heap, eliminate spill, help fill corners. Wheels inside cutting edge make precision work possible near banks, on slopes. ▶

Tournapull—Trademark Reg. U.S. Pat. Off. Fullpak—Trademark P-1030-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 408

Hampshire, Maine, New Jersey, parts of Pennsylvania, and the Canadian provinces of Quebec, New Brunswick, and Nova Scotia.

Pioneer manufactures a complete line of aggregate-producing and road-building equipment.

Caterpillar names manager of new plant in Scotland

Robert J. Dawson has taken over his responsibilities as manager of the new Glasgow, Scotland, plant of the Caterpillar Tractor Co., Peoria, Ill. He was formerly assistant manager of the firm's engine factory in Peoria.

Assisting Mr. Dawson will be Hans G. Frommer, production manager, and William I. Cusson, superintendent of assembly.

The new plant will manufacture D8 and D4 crawler tractors for the export market.

Thor appoints managers

Three zone managers to handle sales of electric tools and the Speed-Tool have been appointed by the Thor Power Tool Co., Aurora, Ill.

Heading the east coast zone is J. P. Stine. From headquarters in Newark, N. J., he will cover New York, Boston, Buffalo, and Newark territories.

C. B. Baron has been named west coast manager. The zone covers Los Angeles, San Francisco, and Seattle territories, with headquarters in Los Angeles.

Mississippi, Tennessee, Alabama, North and South Carolina, Georgia, Florida, and most of Louisiana will be handled by R. J. Burch, the new southeastern zone manager. He will make his headquarters in Birmingham, Ala.

Leschen names two new sales representatives

Two new district sales representatives have been appointed by the Leschen Wire Rope Division of the H. K. Porter Co., Inc., St. Louis, Mo. Dean Courtright will cover a territory that includes the state of Washington, northern and western Idaho, and Montana.

Covering Manhattan, The Bronx, and all of Long Island, N. Y., is Richard M. McKenna. He was formerly with the Edward Ehrbahr Equipment Co., New York, N. Y.

Fulton elects officers

A new governing body has been elected by the Fulton Bag & Cotton Mills, New Orleans, La. Robert O. Arnold was chosen as chairman of the board of directors and president of the organization.

Norman E. Elas, Jason M. Elas and Clarence E. Elas were named divisional vice presidents, in charge of the mills, fabrics, and bag divisions, respectively. Also elected as vice presidents were Fred. G. Barnet and E. Monroe Hornsby.

E. A. Cronheim was appointed secretary and treasurer. Eleven members of the board of directors were re-elected.

Paul W. O'Donnell, the new sales manager for E. D. Bullard Co.

Bullard sales manager

The E. D. Bullard Co., San Francisco, Calif., manufacturer of industrial safety clothing, has appointed Paul W. O'Donnell sales manager. Formerly distributor sales manager for the territory east of the Mississippi River, he will now head distributor sales on a nationwide basis.

Schield Bantam appoints

John C. Carlile has been appointed Southwest district sales manager for the Schield Bantam Co., Waverly, Iowa. From his headquarters at 2700 W. Century Blvd., Inglewood, Calif., Carlile will cover California, New Mexico, Arizona, Colorado, Nevada, and the western part of Texas.

Prior to his present appointment, Carlile had been district sales representative for LeTourneau-Westinghouse and the J. D. Adams Co.

Detroit Diesel appoints sales-promotion manager

D. W. Radebaugh, former sales engineer in the automotive and tractor sales section, has been appointed sales promotion manager for the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. He succeeds T. L. Guarniere in the post.

In another personnel change, D. P. Gosheff has been named Florida sales representative. He will coordinate the diesel sales activities of marine and industrial dealers from his branch headquarters at Miami and the sub-branch in Jacksonville.

"I like the Adams for its economy of operation," says sub-contractor Roy Preston, of San Diego

Grader above is spreading sub-base material on a county road connecting Mt. Signal and Coyote Wells, Imperial County, California. Owner Preston is working for prime contractor N. L. Basich, of South San Gabriel. Contract calls for 22.6 mi. of grading and roadway-mix surfacing.

On this project, Roy Preston used his Adams 550 to pioneer haul roads, rip old asphaltic pavement, dig ditches, finish slopes, level sub-grade, and fine-grade before top surface was applied. Preston says, "I find there is substantial saving in fuel consumption with the Adams over other makes of motor graders, and maintenance and repairs are lower than any other I have used."

Adams does more work, in less time, at lowest cost

Let us prove it to you in actual demonstration! You can best see why this grader gets more work done when you watch the smoothness of a modern Adams at work. See how easily it picks up the load, how constant-mesh transmission shifts easily — with no clash of spur gears.

Eight forward speeds (1.4 to 25 mph) provide the necessary wide speed range to handle all operations at fastest practical rate with maximum power. Three additional "creeper speeds", optional (.23 to 1.82 mph), gear the grader down for accurate finishing in tight places, make it easy to penetrate rooty, rocky terrain, eliminate shock loads from machine. And 4 reverse speeds (1.8 to 13 mph) save time on shuttle-grading and mixing. *No other grader offers this wide range of speeds* which enables Adams to do *more* work in *less* time at *lower* cost.

Make a date!

Accept our invitation to see a modern Adams in operation. Come see us, or let us take you on a field trip where you can see these graders at work, talk to their owners, and ride a modern Adams yourself!

A size ADAMS for every need

Model 660—150 hp diesel engine, 27,730 lbs.
Model 550—123 hp diesel engine, 23,500 lbs.
Model 440—104 hp diesel engine, 21,500 lbs.
Model 330— 80 hp diesel engine, 20,500 lbs.
Model 220— 60 hp diesel engine, 14,865 lbs.
TraveLoader — A high-speed, heavy-duty, self-propelled, belt-type loader for picking up materials and loading into trucks from windrows or stockpiles, 55 hp gasoline or 60 hp diesel engine, 16,800 lbs.

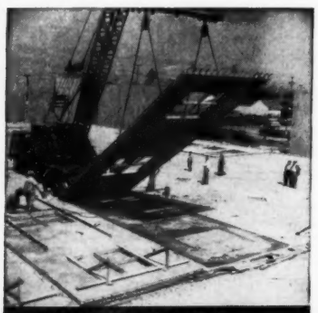
Leveling sub-grade in preparation for roadway-mix surfacing, Adams 550 holds grade to close tolerance. With wide range of speeds, operator selects most practical speed for maximum power. AG-24-G-b

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
For more facts, use Reader-Reply Card opposite page 18 and circle No. 409

Wedge tensioning unit

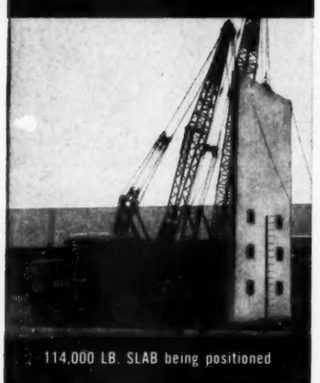
■ A new anchorage device for tensioning prestressing bars for concrete, said to maintain all the advantages of the threaded-bar method while adding speed, simplicity, and economy features, is discussed in a brochure from the Truscon Steel Division of the Republic Steel Corp. Some of the advantages claimed are that there are no threads to be damaged in handling or shipping, stock-length bars can be adapted for any size or shape of girder or structure, and 100 per cent of the bar strength is developed.

To obtain this brochure write to the Truscon Steel Division, Republic Steel Corp., Youngstown 1, Ohio, or use the Request Card at page 18. Circle No. 164.

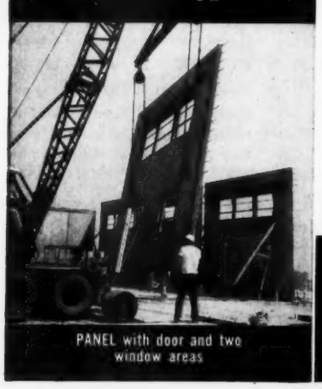


PRECAST PANEL 32' high, 18½' wide with two large window areas.

TRUSS has 60' span at top



114,000 LB. SLAB being positioned



PANEL with door and two window areas

SUPERIOR

Complete Accessories Plus Experience on Tilt-Up Jobs!

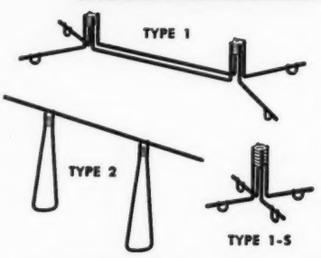
On every Tilt-Up job the proper type of Pick-Up Inserts and Brace Anchors as well as their location in the slab or precast structural member are of prime importance in order to withstand the stresses occurring when *tilting, lifting,* and *positioning.* As pioneers in this field, SUPERIOR has developed various types of accessories and correct procedures resulting from the experience of thousands of job applications.

SUPERIOR accessories are designed for fast and efficient handling of all types of precast panels and structural members. The Pick-Up Insert provides dependable anchorage for bolts which secure a lifting angle to which slings are attached when the panel is raised. Brace Anchors secure the temporary bolts by which the Braces are attached. The exclusive pivoting action of the adjustable Braces permits quick positioning and alignment of panels. Braces are assembled with 2 x 4's or pipe of lengths to fit job conditions.

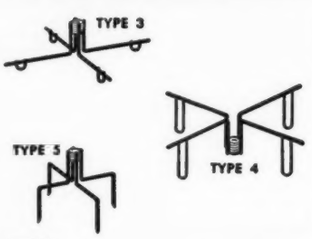
The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete layout service provide a combination which offers safe and efficient handling of precast panels and structural members.

For further details refer to Sweet's Catalog or send for Bulletin TU-3.

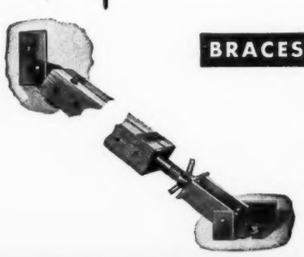
PICK-UP INSERTS



ANCHORS for BRACES



BRACES



SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office 1775 Broadway, New York 19, N. Y.

Pacific Coast Plant 2100 Williams St., San Leandro, Calif.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 410

Black & Decker opens two new sales branches

The Black & Decker Mfg. Co., Towson, Md., has opened a relocated factory sales and service branch in Pittsburgh, Pa., and a completely new branch location in Columbus, Ohio.

Located at 5437 Baum Boulevard, the Pittsburgh branch will serve western Pennsylvania and part of West Virginia, with Thomas W. Hartzell as branch service manager. The new Columbus branch, located at 488 E. Main Street, will be headed by Dale E. Banfill.

Both branches maintain a large stock of replacement parts and are staffed by factory-trained personnel.

New truck cranes

■ A two-color catalog describing two new 25-ton Lorain Moto-Cranes, the Models MC-425 and MC-425W, is available from the Thew Shovel Co. The catalog describes several new features, plus views of the Moto-Cranes in action. Among the new developments detailed are the Shear Ball mounting that is said to eliminate all turntable rollers, center pins and centering gudgeons with its constant maintenance and adjustment, and a crane boom with main chords of square tubular cross section for greater strength and lifting capacities at reduced weight.

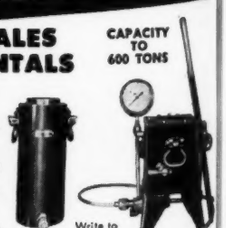
To obtain this catalog write to the Thew Shovel Co., 28th and Fulton Road, Lorain Ohio, or use the Request Card that is bound in at page 18. Circle No. 163.

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
PILE TESTING
UNDERPINNING
BRIDGES
PIPE PUSHING
SOIL TESTING



DESIGNERS and MANUFACTURERS OF

Hydraulic Units For Special Applications

RICHARD DUDGEON INC. EST. 1900

789 BERGEN STREET BROOKLYN, N. Y.
• ST 9-4040 •

For more facts, circle No. 411

GIGANTIC 5½ MILLION DOLLAR CONSTRUCTION EQUIPMENT AUCTION

April 30th, May 1st & 2nd at 9:30 A.M. (Mountain Time), Each Day and Continuing Until Sold.

JAMES & WUNDERLICH
Joint Venture Contractors
TIBER DAM STATION
CHESTER, MONTANA

Tiber Dam Location is Approx. 80 Miles North of Great Falls, Montana, and 20 Miles Southwest of Chester.
This is One of the Finest Lots of Equip. Ever Offered For Sale at Public Auction.
Inspection daily starting April 20th to day of sale.

36—Euclid Tractors, w/25 Cy. Bottom Dumps
6—Euclid Tractors, w/13 Cy. Bottom Dumps
8—Euclid Tractors, w/Scrapers
24—Cat. 2 U-Ser. & A.C. Hd. 20-Ser. Tractors
6—Euclid End Dumps, 2-P & H Shovels #1055

Thew-Lorain Motor Crane #30 • N.W. Comb. Shovel #80D Bucyrus-Erie Crane Boom #54B • 35 G.M.C. & Chev. Trucks, 1953 & 54 • 42 House Trailers • Sheepsfoot • Rippers • Loaders • Air Compressors • Air Tools • Pumps • Welding & Shop Equip. • Quantity of Parts • Hundreds of other large pieces not listed.

WRITE • WIRE • PHONE FOR DESCRIPTIVE BROCHURE

MICHAEL TAUBER - PAUL ARONS CO. AUCTIONEERS APPRAISERS
220 S. LOS ANGELES ST., LOS ANGELES, CALIF. • PHONE MAdison 6-0621

For Information Call F. A. Bleecker, Phone EDison 4-2771, in Chester

Shawnee's Scout D-70-HL backhoe.

Tractor-mounted backhoe has hydraulic outriggers

■ A new Shawnee backhoe, the Scout D-70-HL, is basically the same unit as the Scout 70, except that it is available with individually controlled hydraulic stabilizers. The stabilizers permit the operator to level the equipment on slopes or when working with one side of the tractor up on a curbing. They also make it easy to level the tractor quickly for digging plumb holes on slopes.

The new Scout mounts on a number of popular-make tractors, and is recommended as a companion tool for the Shawnee Special front-end loader. Mounting the two attachments together provides a framing structure which "cradles" the tractor and relieves it of some of the stresses and strains encountered in heavy digging.

The Scout backhoe digs 12 feet deep, reaches 14 feet, and has a digging force of almost 6,000 pounds.

For further information write to the Shawnee Mfg. Co., Inc., 1947 N. Topeka, Topeka, Kans., or use the Request Card at page 18. Circle No. 154.

Fittings catalog

■ A pocket catalog is now available from the W-S Fittings Division of the H. K. Porter Co., Inc. It contains basic information on all the division's products, including forged steel screwend and socket-welding fittings, forged stainless and alloy-steel fittings, 150-pound stainless fittings, unions and special fittings, and hydraulic pumps and jacks. Size ranges and design features are included.

To obtain this catalog write to the W-S Fittings Division, H. K. Porter Co., Inc., P. O. Box 95, Roselle, N. J., or use the Request Card at page 18. Circle No. 162.

Two-axle tandem rollers

■ Buffalo-Springfield's line of heavy-duty two-axle variable-weight tandem rollers for surface-finishing jobs, highway and public works projects, and maintenance and repair work, are featured in a new catalog. A table gives the comparative dimensions, specifications, weights, and compression data. The component parts of the rollers and accessories are shown.

To obtain Bulletin S-70-1155 write to Buffalo-Springfield Roller Co., 1210 Kenton St., Springfield, Ohio, or use the Request Card at page 18. Circle No. 99.

Rugged hot-oil hose for asphalt paving

■ A new hose made of synthetic rubber, steel wire, and glass fiber has been developed by Hewitt-Robbins, Inc., to handle hot oil used in the construction of asphalt and other tarvia-type roads.

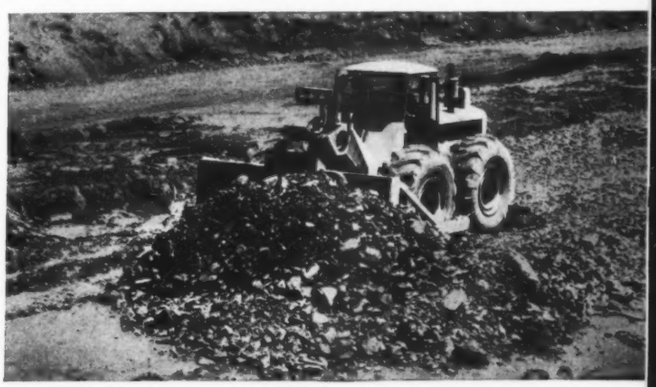
Flexible and relatively light in weight despite its rugged construction, the new hose is reported to withstand the effects of high temperatures, chemically-caused decomposition, and rough handling to which road-building equipment is frequently subjected.

Available in sizes with inside diameters of ¾, 1, 1½, and 2 inches, the hose has a maximum working pressure in each size of 250 pounds per inch.

For further information write to Hewitt-Robbins, Inc., 666 Glenbrook Road, Glenbrook, Stamford, Conn., or use the Request Card at page 18. Circle No. 6.

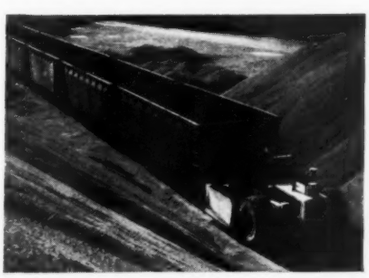
Speed and Mobility

get more work done!



Tournatractor takes the shortest route to job ... via highway or cross country... cuts hours from job-to-job moves.

208 hp Tournatractor with PCU on rear can be hooked up to pull scrapers, rooters, and rollers.



Rubber tires do not damage rails or ties... unit can switch up to 10 fully-loaded railroad cars at once.

Whenever your application involves scattered job assignments, Tournatractor's 19 mph forward speed and extreme maneuverability cuts moving costs and reduces the non-pay hours of moving time. Big, low-pressure tires let you drive Tournatractor anywhere. For long moves, you save time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Speed on the job

Tournatractor pulls, dozes, pushes at working speeds 2 to 3 times faster than crawler tractors. You have 3.69 mph in second gear, 8.38 mph in third, compared to crawler speeds of around 2 mph in second, and 3 mph in third. Tournatractor travel speed of 19.23 mph compares to the crawlers' top ranges of 4 to 6 mph. You change gears instantly ... waste no time shifting.

8 mph reverse speed

High reverse speeds give a very important time-saving advantage to tractor-on-rubber. Nearly 50% of your working cycle on dozing or pushing jobs is usually spent backing up. Tournatractor's reverse speed cuts crawler backing up time by almost 25 to 50%. Crawler highs in reverse range from 3.1 to 6.2 mph. Tournatractor high in reverse is 8 mph.

Instant shifting

Constant-mesh transmission aids high-speed performance by eliminating delays in changing gears ... saving vital momentum ... gives you any gear ratio instantly. Tournatractor works in higher gear ratios because there is no loss of momentum for shifting. Torque converter increases this advantage by giving you wide automatic over-lapping of gear ratios, without depending on operator to jockey levers to get the most effective ratio of power and speed to load.

Ample flotation and traction

2' wide tires stay on top of soft ground instead of digging in. Lugs bite into underfooting to give traction. Tire pressures as low as 20 lbs. absorb shock. Rolling action compacts loose materials far more effectively than crawlers.

Lower maintenance

There are 4 easy-rolling-wheel-assemblies as compared to more than 500 wearing parts in standard track-assemblies. This means less maintenance. Dollar-wise this reduction in maintenance time can mean a saving of $3 per hour in operating expenses.

Easier to operate

Fingertip electric controls work at the flick of a switch. Steering, raising and lowering the blade, and operating the power-control-unit are all handled by buttons on dashboard. There are no levers, wheels, or other manual controls to handle. Big, low-pressure tires greatly reduce jars and jolts, stress and strain, on both operator and machine.

Interchangeable equipment

Adding to Tournatractor's versatility are a number of interchangeable attachments . . . Bulldozer, Angledozer, Root Rake, Snow Plow. This versatile tractor can also be equipped with a Push-Block, Logging-Winch or Tree-Pusher for additional applications. Drawbar and PCU are available for hauled equipment. Electric-control, open-top scrapers are also available for use with Tournatractors.

Find out for yourself how Tournatractor's go-anywhere mobility and 19 mph speeds can help you get more work done. Compare this rubber-tired tractor alongside your present crawlers. Write or call for a demonstration.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-926-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 412

"WORKS ALL OVER SITE AS A UTILITY CRANE" —Gull Contracting Co.

SILENT HOIST KRANE KAR

POWER STEERING

FLUID DRIVE

1½, 2½, 5, 10, 12½ ton cap. Gas or Diesel; 9 to 37 ft. Booms or Adjustable Telescopic Booms; Solid or Pneumatic Rubber Tires; Magnet, Bucket, All-Weather Cabs available.

Contractors report big savings in time, manpower, and money with highly maneuverable ***KRANE KAR*** Swing-Boom Mobile Crane. Handles steel and concrete forms, lumber, buckets, cement, etc., storing incoming materials and delivering them where needed. Transports heavy burdens up and down ramps. Loads and unloads trucks. Great for maintenance of and as an auxiliary to bigger cranes. Ask for Bulletin #90.

USERS: Turner Construction, Dominion Bridge, Kellogg Co., Johns-Manville, Sordoni Construction, Concrete Pipe and Products, Lock Joint Pipe, A.E.C., Baker Construction, Bethlehem Steel, Consolidated Edison of N. Y.; Merritt, Chapman & Scott; DuPont.

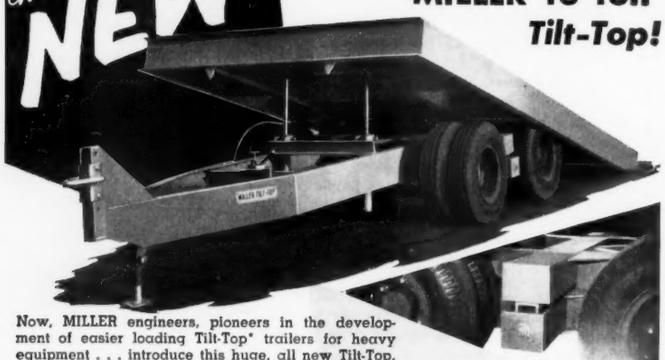
SILENT HOIST & CRANE CO.

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment

898 A 63rd ST., BROOKLYN 20, N.Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 413

announcing the NEW tandem axle MILLER 13 ton Tilt-Top!



Now, MILLER engineers, pioneers in the development of easier loading Tilt-Top* trailers for heavy equipment . . . introduce this huge, all new Tilt-Top.

Designed for easier, faster handling of such equipment as smaller shovels, Barber-Greene trenchers and finishers, backhoes and larger crawler tractors up to 26,000 lbs. gross weight . . . this new Tilt-Top* is massively built. A very low platform height, for this type of trailer, is achieved by placing the platform frame pivot point toward the rear of the tandem axle assembly . . . yet maintaining such perfect balance that it easily tilts under a man's weight.

Two inch oak, job proven for its durability and better climb traction, is used for decking the big 8' x 16'8" platform. Under the platform is a frame like a bridge . . . closely braced with 10" deep steel members along each side where the weight of tractor mounted equipment is carried.

Easier to back and maneuver . . . this super Tilt-Top* replaces the slower loading of more cumbersome trailers with ONE man, TWO minute loading . . . brings new time saving mobility to larger equipment. See the big, new "OT"-13 at your MILLER distributor today!

Heavy duty box section walking beam provides independent wheel action **on each side,** in contrast to straight-thru tandems, assuring less jarring and a more level ride on rough terrain. Walking beam shaft is one of the few equipped with trouble-free Timken roller bearings.

The pivot point of the long, heavy tongue is set way back at the rear set of wheels—providing tremendous double frame strength under the area of greatest load concentration.

Miller Model "OT"-13 $2,200.00* F.O.B. Milwaukee

Complete with platform and eight 7.50 x 15 x 12 ply tires. Any optional equipment extra.

*Plus Freight and 8% Federal Tax

The massive frame is honey combed with 8" deep lateral bracing members for rock solid decking support.

✓ built best

✓ priced best

See your MILLER distributor or write for FREE literature to

Miller Tilt-Top Trailer Co.

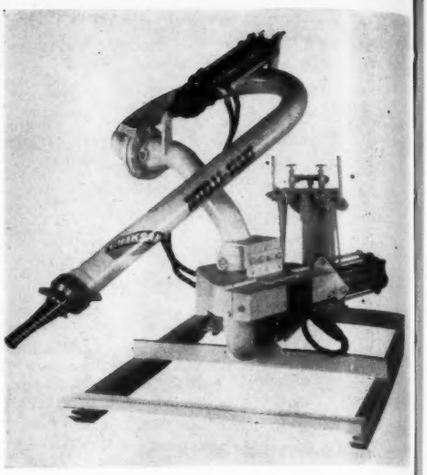
456 S. 92nd St., Milwaukee 14, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 414

Invest in

U. S. DEFENSE BONDS

Now Even Better



The Chiksan MH-4 Intelli-Giant throws a 300-foot stream at the rate of 2,000 gpm.

New hydraulic monitor throws 300-foot stream

■ A new model of the Intelli-Giant hydraulic monitor, lighter and smaller than its predecessor, has been announced by the Chiksan Co. Reportedly capable of throwing a 300-foot stream through a 2½-inch nozzle tip at the rate of 2,000 gallons per minute, the unit is recommended for use in slurrying, overburden removal, compaction of earth-rock fills and other high-pressure jet operations.

The Chiksan MH-4, with its 4-inch supply pipe and 4-inch barrel, is of lighter weight (650 pounds) and of smaller dimension than the older 6-inch Model MH-6, though it features the same 270-degree tube turn barrel said to aid in minimizing friction loss and in balancing vector forces. It has a vertical range of 120 degrees and operates with pressures ranging from 30 to 300 pounds. Remote operation is a feature.

For further information write to the Chiksan Co., Brea, Calif., or use the Request Card at page 18. Circle No. 110.

Mc McCARTER

FACTORY TO YOU

No middleman involved when you buy a McCarter Asphalt Plant.

This factory-to-you plan guarantees you the most for your money in equipment . . . the most satisfactory service.

Designed by our own engineers, built in our own factory, serviced directly by our factory experts.

Our sales engineers will be glad to counsel with you.

REPAIRS AND MODERNIZING

We specialize in remodeling old plants for better production and more efficient operation.

Mc McCARTER IRON WORKS, INC. NORRISTOWN, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 415

The position of the Willimon blade makes it constantly visible to the operator.

Hydraulic grading blade mounts under wheel tractor

■ A new, center-mounted industrial grader blade for the I-H 300 Utility and other tractors has been introduced by J. R. Prewitt & Sons Mfg. Co.

Built for heavy-duty work, the new Willimon blade is designed to do a precision job of grading on even the roughest terrain. The rear wheels of the tractor follow the blade's path, eliminating bounce. Stabilizing arms on either end of the blade give greater control, and double-action hydraulic cylinders provide a constant pressurized grading force.

The six or eight-foot moldboard angles 30 degrees to the right or left manually. Depth and angle of cut are controlled hydraulically. Because of its location, the grader blade is constantly visible to the operator. The blade may be installed or removed in a matter of minutes.

For further information write to the J. R. Prewitt and Sons Mfg. Co., Pleasant Hill, Mo., or use the Request Card at page 18. Circle No. 145.

Truck mixers

■ The Hi-Up truck mixer line, manufactured by Worthington Corp., is detailed in a new bulletin. Special sections are devoted to maximum legal payload, design features, water system, operation, maintenance, and interchangeability of parts. Cutaway photographs detail the input shaft, gear train, clutches, output shaft, and drum-driving chain.

To obtain this bulletin write to Worthington Corp., Worthington and Harrison Aves., Harrison, N. J., or use the Request Card at page 18. Circle No. 37.

Hydraulic motors

■ Dudco MF-100 Series vane-type hydraulic motors are the subject of a bulletin from the Kalamazoo Division of The New York Air Brake Co. The balanced dual-vane fluid motors are the constant displacement type, with speed variations equal to the quantity of fluid supplied, and torque varying directly with the pressure. A selection data chart lists pressures up to 2,000 psi and speeds up to 2,400 rpm for the four models.

To obtain Bulletin DM 321 write to Kalamazoo Division, The New York Air Brake Co., P. O. Box 1069, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 15.

Crane-excavator

■ A self-propelled crane-excavator, the Schield Bantam Model CR-35, is described in a bulletin from the firm. Important features of this ⅜-cubic-yard 6-ton unit, according to the literature, are: one-man operation; no-shift forward-reverse travel design; and 19½-foot outside turning radius. Also included are specifications, operating data, capacities of the unit, and the digging ranges for the crane, shovel, and backhoe attachments.

To obtain this bulletin write to Schield Bantam Co., Waverly, Iowa, or use the Request Card at page 18. Circle No. 68.

Book on traffic control

Bulletin 112 of the Highway Research Board, "Effects of Traffic Control on Street Capacity", contains four papers presented at the organization's 34th annual meeting in January, 1955. Each paper is based on a study of a particular phase of the problem.

Priced at 90 cents, Bulletin 112 may be obtained from the Highway Research Correlation Service of the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

Trimming back banks, 2½-yard shovel loads Rear-Dumps with 9 to 10 tons of granite and dirt, in an average of three passes. Loading time in this rocky going: about 1 minute 50 seconds.

"Can't be beat for work in cramped quarters," says supt. on mountain road job

To relocate four miles of dangerous, winding, one-way highway through the Sierra Nevada mountains in western California, Ball & Simpson, Berkeley, moved about 800,000 cubic yards of granite.

This job required sturdy haul equipment that would move rock fast during the summer months before snow closed roads for the winter. To handle this work, company drove in three, sure-footed, 28 mph D Tournapull Rear-Dumps.

Work faster on mountain roads

Tournapulls' 90° turning ability, provided by instant-acting, easy-to-operate power steer, enabled these Rear-Dumps to spot for load and dump faster and more safely than could a conventional dump-truck.

Giant multi-disc four-wheel air brakes, with more brake surface on one wheel than most haulers have on all four, gave operators confidence to use Tournapulls' top speeds on steep, narrow mountain grades.

Says Operator Gordon D. Wood, "These Tournapull Rear-Dumps have good brakes that you can depend on to stop *right now*. Machines are easy to handle, too. They certainly get around good in narrow spots."

Because of Tournapull's advantages, each Rear-Dump was able to average 1000′ cycles in 4 minutes 10 seconds.

Superintendent E. E. Frost, said that, in the best production he could recall, each of the three Rear-Dumps hauled 200 loads 300′ down a steep grade, during one 10-hour day.

He describes this relocation job on the Sonora Pass Road as one of the toughest examples of rock road work he had ever seen. "Tournapull Rear-Dumps can't be beat. They are a wonderful piece of equipment for this type of work. Tournapulls run in and get under a shovel so much easier than a truck!"

No major repairs in 3 years

During three seasons in the Sierra Nevada mountains, machines have experienced very little downtime, needed no major repairs. Although the three "D's" have been used more than 2500 hours each, original tires are still in good condition.

Why not check on what this power, speed, and production can do on your hauling jobs? Ask your LeTourneau-Westinghouse Distributor for owner-verified production figures on the size Rear-Dump best suited to your job . . . the 11-ton "D" . . . the 22-ton "C" . . . or the big 35-ton "B".

Tournapull dumps in ½ minute, including time maneuvering to edge of bank. "They're fast dumpers" says Operator Gordon D. Wood. Working a 58-hour week, Tournapulls hauled 75% of the material in this road relocation. Balance was moved by 2 crawler-scraper combinations and 2 crawler-dozers.

Rear-Dumps hauled granite-fill for relocation of 4 miles of mountain highway. The new, modern, two-way road, built under the direction of the Bureau of Public Roads, eliminates a narrow winding section of the Sonora Pass Road (State Route 108), between Dardanelle and Strawberry.

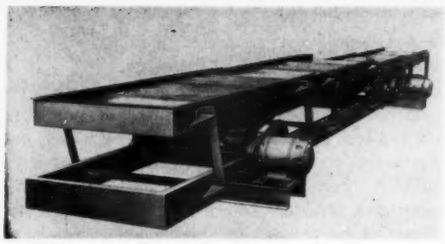
Tournapull—Trademark Reg. U.S. Pat. Off. DR-914-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 416



Imco balanced screen conveyors are easily converted to any one of a variety of material-preparation units.

Low-cost conveyor adapts to job conditions

■ Said to permit the lowest possible initial investment for screening or conveying equipment, Imco balanced screen conveyors, manufactured by Williams & Green, are available in a variety of screening surfaces and lengths.

Designed for smooth, easy operation without the use of rigid, expensive mounting installations, Imco units provide low-cost screening or coarse sizing from ⅛ inch up on stone, sand, gravel, and other materials, according to the manufacturer.

Imco balanced screens are available in standard sections for fast, easy conversion into screens, conveyors, picking tables, or sizing and scalping screens. They are constructed of heavy-duty structural-steel plate and are equipped with wire mesh, perforated plate, flange lip, or other required screen dressing. The units are built to operate from any existing power supply.

For further information write to Williams & Green, Clearfield, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 78.

Rubberized asphalt

■ A folder from Berry Asphalt Co. describes a rubberized asphalt that is said to be an all-weather sealcoat for roads, highways, streets, and pavements. The folder claims that the adhesiveness and resiliency of rubber has been retained in the Berry blending process. The rubberized asphalt is less susceptible to temperature, holds more aggregate, saves on bitumen, and requires less maintenance, according to the folder.

To obtain this folder write to Berry Asphalt Co., P. O. Box 800, Magnolia, Ark., or use the Request Card at page 18. Circle No. 174.

Concrete form system

■ The Quick-Set form system, including No-Twist form ties that cannot turn in concrete, is described in literature from the Lov-Lok Form & Hardware Co. of Chicago. Features of the system include a minimum amount of hardware, ease and simplicity of erection and stripping, high strength design, and the need for fewer 2×4's, according to the bulletins.

To obtain this literature write to the Lov-Lok Form & Hardware Co., 4550 W. Patterson Ave., Chicago 41, Ill., or use the Request Card at page 18. Circle No. 167.

Crawler tractors

■ A booklet published by the American Tractor Corp. illustrates how and where the company's 30 to 60-hp tractors are applicable in construction. Featured are pictures of the complete TerraTrac line for 1956. Five new gasoline and three diesel-powered tractors are shown, plus a complete selection of matching loaders, dozers, backhoes, sacrifices, winches, and other equipment. Information is included on TerraTrac's torque converter drive and hydraulic power-shifting transmission.

To obtain this booklet write to American Tractor Corp., Churubusco (Fort Wayne), Ind., or use the Request Card at page 18. Circle No. 155

IN MASONRY BITS — the TIP'S the THING!

That's Why Most Experienced Bit Users are Switching to

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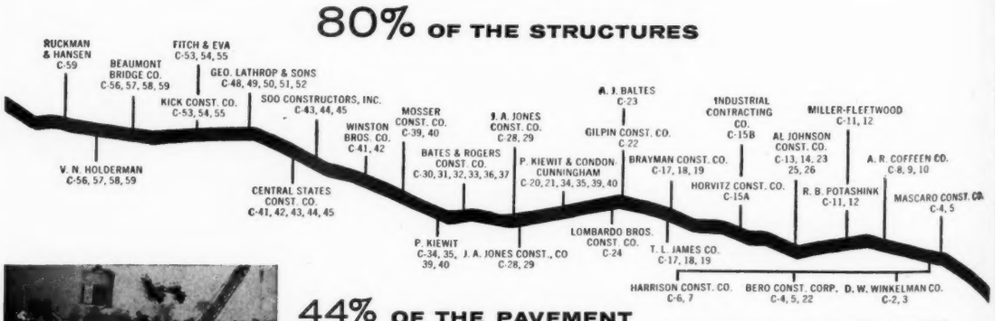
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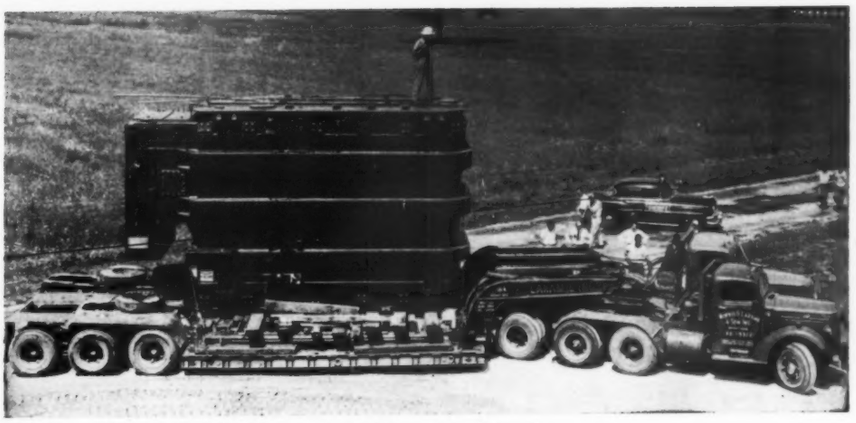

A SIDE-BY-SIDE COMBINATION of two Talbert Model T3D-50-RG-RA low-bed trailers, which provided a 52-tire surface for weight distribution, was used to move what is said to be the largest transformer ever transported over the highway in the Detroit area on secondary roads. By positioning the massive transformer on the decks of the pair of 50-ton trailers, Morris G. Laramie & Son, Detroit, Mich., was able to do the job safely, economically, and in a minimum of time. Talbert trailers are available in capacities of from 10 to 100 tons. For further information write to **Talbert Trailers, Inc.**, 7950 W. 47th St., Lyons, Ill., or use the Request Card at page 18. Circle No. 169.

Motor-in-head vibrator solves burn-out problem

■ A high-cycle motor-in-head concrete vibrator featuring speed of operation, good productivity, and greatly improved durability is being marketed by Dart Mfg. & Sales Co. The new unit is available for use with 115 or 230-volt 180-cycle generators.

An outstanding feature claimed for the new vibrator is that the motor design virtually eliminates the danger of heat and overload damage without the use of fuses or thermal breaker. The unit may be safely operated out of concrete without a special cooling device, thus minimizing the burn-out problem common with vibrator operation.

Preloaded extensions require no wire splicing, but are simply plugged in for immediate operation. Switches and connections are waterproof. The vibrator head is a 2½-inch-diameter unit.

For further information write to the Dart Mfg. & Sales Co., 1002 S. Jason St., Denver, Colo., or use the Request Card at page 18. Circle No. 2.

Crane, hoist hooks

■ Safety hooks with safe working loads of from 1,000 to 50,000 pounds are described in a bulletin from E. D. Bullard Co. The drop-forged steel hooks have a safety gate that cannot be opened unless the lock pin is manually depressed in the opposite direction from the gate opening, according to the bulletin. Data is given on throat openings, shank diameters, shank areas remaining above the gate, and bail or eye nut sizes.

To obtain this folder write to E. D. Bullard Co., 275 Eighth St., San Francisco, Calif., or use the Request Card that is bound in at page 18. Circle No. 104.

Goodyear appointment

Lawrence P. Thies has been assigned to the Cleveland district as a special representative of the chemical division of the Goodyear Tire Rubber ber Co., Akron, Ohio.

Thies, a graduate of Kent State University, will handle sales of vinyl resins.

Spray-Lube for OPEN GEARS

Spray-Lube Saves 95% of the Lubricant and does a 100% BETTER JOB!

USE SPRAY-LUBE ON ALL GEARS NOT RUNNING IN OIL

★ A heavy black petroleum gear compound packaged in a spray container.
★ This grease is extreme pressure quality and ideal for the heaviest duty applications.
★ Many of the largest industries and contractors use and commend Spray-Lube.
★ Real gear protection summer or winter under the most adverse conditions.
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NO BRUSH • NO PADDLE • NO PRE-HEATING

Used on cranes, backhoes, shovels, rollers, rigs and winches.

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...cut costs 51%

HARDEST, MOST DURABLE CONCRETE SAWING BLADE EVER MADE! Sounds like a big order doesn't it? Well it took Consolidated years, to successfully put DIAMONDS... the hardest natural stone, IN CARDBIDE... the toughest... man-made metal.

THE RESULT... a versatile concrete sawing blade that lasts 2 to 3 times longer than conventional diamond blades. Longer blade life means lower costs (up to 51%) ...lower costs mean lower bids... lower bids mean more contracts... more profit!

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Weather charts

The weather outlook for May

The two accompanying maps, indicating average weather conditions throughout the United States during the month of May, show the expected number of days with rainfall and the number of days with temperatures over 90 degrees.

Those areas indicated on Chart I as dry will probably have fewer than 6 days of rainfall during the month. Medium areas will average between 6 and 12 rainy days, and wet regions can expect more than 12 days with rain. However, a good many of these days when rain is predicted will probably have only brief spring showers and not heavy storms.

Warm areas indicated on Chart II will experience, on the average, more than 2 days of temperatures of 90 degrees or higher. Between 1 and 2 above-90 days can be expected in medium areas, while less than a day of 90-degree temperatures are anticipated in cool regions.

Relatively speaking, contractors in Chicago and New York may expect wetter weather than those in Kansas City or Boston, and San Francisco will, no doubt, be drier than Portland, Oreg. More hot days can be expected in Minneapolis and in eastern Oregon than in Columbus, Ohio, or northern California.

Prepared for CONTRACTORS AND ENGINEERS by Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo., the charts show only average conditions and are not intended as specific forecasts. However, Weather Corp. of America will answer specific questions regarding the charts or other weather problems. THE END

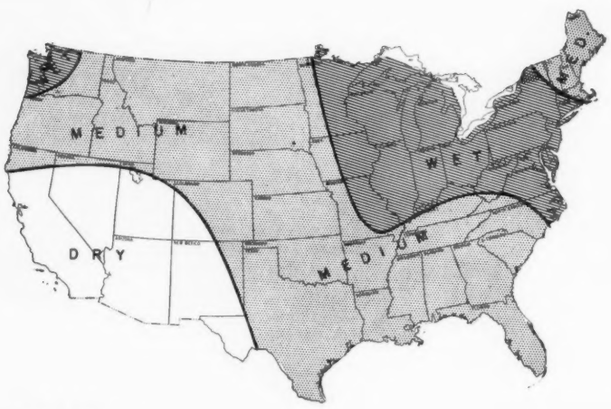

Chart I—Precipitation.

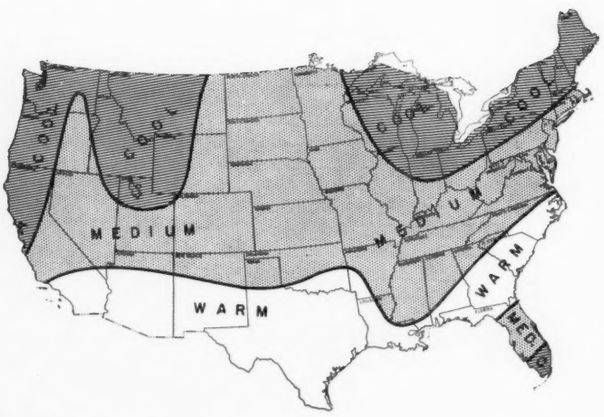

Chart II—Temperatures.

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13 Draglines, Shovels, Cranes Page, Manitowoc, P&H, Northwest, & Koehring
18 Tractors, Caterpillar D8, D7, D6, & D4
4 Motor Graders, Caterpillar No. 12 & 112
6 Tractors & Scrapers, Euclid 14TDT21SH
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4 Scrapers, LeTourneau, Laplante Choate
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Phone: 5-2406

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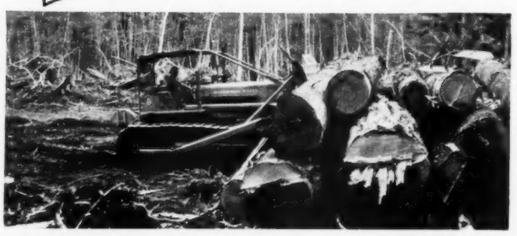
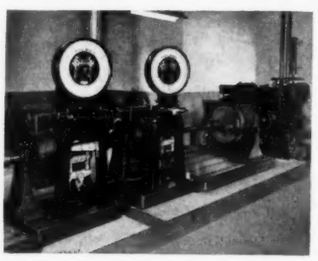
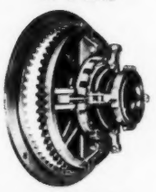


ROCKFORD CLUTCHES, of all types and sizes up to 18", are thoroughly tested for torque capacity — with this powerful, accurate Dynamometer. Arranged with an Automatic



OVER



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Cycling Device, this Dynamometer is also used for severe wear testing of facings, linkage, splines, etc. Let ROCKFORD engineers utilize our extensive clutch testing equipment to develop more efficient clutches for *your* products.

ROCKFORD
Clutch Division
BORG-WARNER
314 Catherine St., Rockford, Ill.

CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 424

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CLASSIFIED ADVERTISING

An advertising inch in the Trading Post is measured ⅞-inch vertically on one column. Space reservations close in the New York office on the 10th of the month preceding publication. Send your classified copy to:

The Trading Post, Contractors & Engineers
470 Fourth Avenue, New York 16, N. Y.

RECONDITIONING OF YOUR GMC 71 DIESEL INJECTORS

Reclamation of and conversions to "H.V." injectors also available.

SAVE HALF THE COST

Write for Catalog and the Name of Your Nearest HANCOCK Dealer.

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Due to our expansion program, a permanent position for an individual well versed in construction practices and estimation is available in a large pulp and paper manufacturing plant in the Upper Midwest. Civil or Electrical Engineer graduate is desired. Our employees know of this opening. Your confidential reply should include personal, educational, and work history together with salary thinking. **Write Box 404, Contractors and Engineers, 470 Fourth Ave., New York 16, N. Y.**

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Need man with initiative and drive. Construction survey, estimating and layout. Expanding Midwest organization. Opportunity. Degree not required. Experience in marine construction helpful but not essential. Salary open depending on applicant. Replies confidential. Advise personal data, work and educational background, salary expected.

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For Sale

Used Semi Trailers: ACID—some insulated. ASPHALT — insulated. Good, late models and real bargains. Immediate delivery. Contact Berkey or Gingerich at P. O. Box 591, Iowa City, Iowa.
Phone 8-3691, 7798 or 4719.

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Experienced construction equipment salesman wanted, to travel on a national or regional basis. Under 45. Car required. For rapidly expanding Milwaukee manufacturer. In reply, outline experience and qualifications. Our employees know of this ad.

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CONTRACTORS AND ENGINEERS
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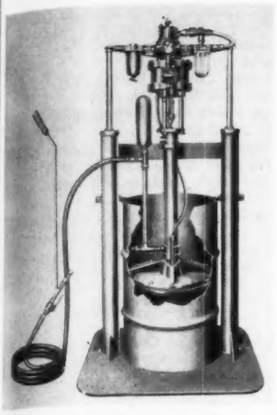
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs. Applied quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.



New joint sealer applies cold sealing compound

A new joint sealer for applying cold sealing compounds is announced by the Clipper Mfg. Co. The CP-400 cold-applied joint sealer is a complete, ready-to-use unit requiring only connection to a suitable air compressor.

The new unit consists of two vertical air cylinders which straddle a 55-gallon material drum. They are connected at the top by a crossbeam which supports an air pump. The lower extension of this pump is attached to a drum wiper plate which enters the material drum.

In operation, the two cylinders raise the pump and drum wiper plate. The material drum is placed between the two cylinders and the drum wiper plate is lowered into the drum. The drum wiper plate does not "push" the material, but rather serves to maintain an even level of sealing material, which is pumped out of the drum by the air pump.

Besides all-weather sealing of contraction joints, the CP-400 is recommended for calking, waterproofing, applying protective coatings, heavy-duty lubrication, spraying paint and rust preventive, and many other uses.

For further information write to the Clipper Mfg. Co., Suite 635, 2800 Warwick, Kansas City, Mo., or use the Request Card that is bound in at page 18. Circle No. 85.

Wooldridge warehouse opens

Now serving the earthmoving industry throughout the eastern states is a completely new CCS Wooldridge factory parts warehouse at Perth Amboy, N. J.

The warehouse, part of the long range expansion in engineering development, service, and distribution that started when Wooldridge became a division of Continental Copper & Steel Industries, Inc., is being operated under the supervision of Anthony Zulkowski.

Eastern district manager appointed by Gar Wood

Recently appointed as Eastern district Manager of the construction equipment division of Gar Wood Industries, Inc., Wayne, Mich., is D. E. Ollendorf.

He will cover the east coast as far north as Quebec and as far south as Virginia.

For more facts, use coupon or circle No. 425→

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New Whiteman Twin

does the work of two ordinary finishers!

- Combination floating-finishing trowels!
- Instant trowel-pitch adjustment!
- Protected ball thrust bearings make trowel adjustments easier!
- Timken bearings in gear case!
- Works 5 feet in one pass!

FINISHES FULL 5' WIDTH

The new Whiteman TWIN Floating-Finishing Machine finishes more slab with one man than two large diameter ordinary machines with two men! Already acclaimed by contractors as the most satisfactory "big job" machine. Easier handling — even by less experienced operators. The counter-rotating, "no-torque" trowels mean steadier, smoother operation. The wide pattern shows up and corrects irregularities instantly, assures perfect results never before obtainable.

ALSO NEW!
Whiteman J-4
Four-trowelled workhorse

This rugged new Whiteman finishing machine produces an extremely smooth slab. The four-trowel construction provides smoother, steadier performance, reduces vibration.

- Heavier, stronger spider plate!
- 1" Hex. trowel bar!
- Huskier trowel adjustment arms
- Safety-switch on grip!
- Instant, easy trowel adjustment while operating!
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- Timken bearing in gear case!
- 34" diameter!

Whiteman — pioneer builder of concrete finishing machines, has sold more power finishers than all other makes combined!

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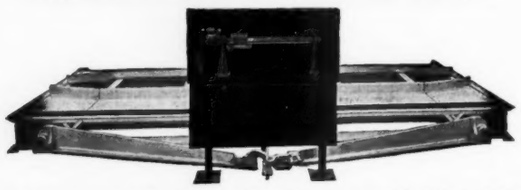

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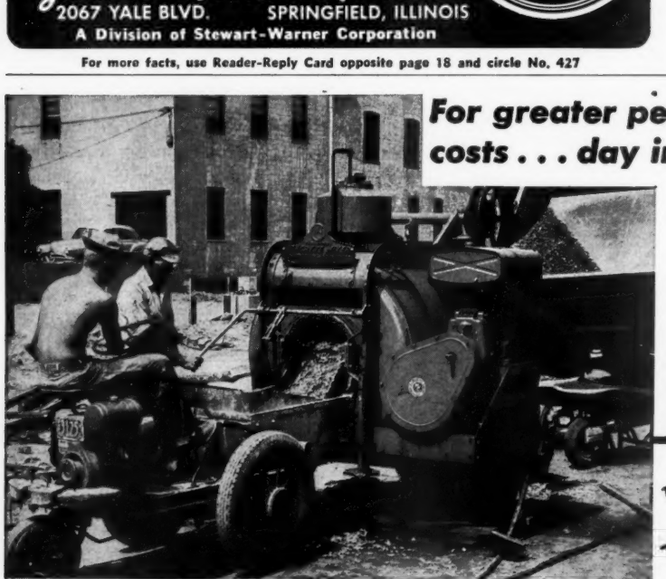

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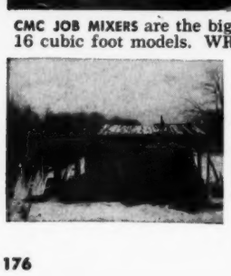

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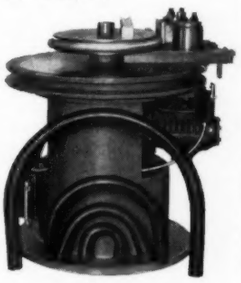

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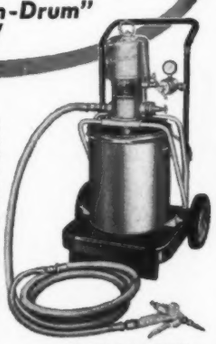

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Surveying washington

by HUBERT KELLEY, JR.

One of the stormiest debates in this session of the House of Representatives preceded the vote on the controversial $760 million upper-Colorado project. But even when the argument was most bitter, its approval was a foregone conclusion, and the Administration-backed measure was passed by a vote of 256 to 136.

The House version of the water-storage and irrigation project did not include Echo Park Dam, which the Senate had approved. Had the House retained Echo Park, the Colorado River project would have cost more than one billion dollars.

To have been built in Dinosaur National Monument near the Colorado-Utah Border, the dam was opposed by several conservation groups who claimed that it would destroy the scenic qualities of the park.

Chief opponents of the bill were congressmen from southern California, who claimed that the project would rob their area of water, and farm-belt spokesmen who had felt that the addition of more farm acres would only tend to make the surplus-crop problem worse. Others feared that the project would never pay.

Under the bill, calling for the construction of four dams and eleven irrigation projects, more than 132,000 new acres would be irrigated and 234,000 more would receive additional water. Located in four states, the dams are the Glen Canyon in northern Arizona, the Flaming Gorge in Utah, the Navajo in New Mexico, and the Curecanti in Colorado.

Led by the Colorado delegation, the bill's backers argued for its passage. The new dam, they said, would hold back the excess water now running into the Gulf of California, and thus actually insure the area of a regulated supply. Insuring that the acreage would not be used for surplus crops, the House adopted an amendment to outlaw surplus-crop production for ten years after the enactment of the law.

Lastly, the bill's backers argued that only $7.4 million—less than one per cent of the total $760 million—would not be repaid to the government, a small price, they argued for the flood control and conservation benefits to be obtained.

Those opposed to the bill charged that the proposed dams were feasible from an engineering point of view, particularly since the site of the proposed Glen Canyon Dam in Arizona contained Chinle's shale.

Experiments on the floor of the House, performed by Rep. James A. Haley, (D.-Fla.), and Rep. Stewart Udall, (D.-Ariz.), attempted to prove whether the shale was soluble in water.

Rep. Haley dropped several pieces of it in a glass of water, made a speech, and then noted that the shale had turned to mud. Rep. Udall used a core from a diamond drill of the shale, dropped it in water, made a speech, and then drank the glass of water, in an attempt to prove that it was not soluble.

As the bill headed for committee, with the Senate expected to go along with the changes made by the House, Rep. Joseph Martin, (R.-Mass.), referred to it as a benefit to the country as a whole.

Judging by the February record, the construction outlook for the remainder of the year has rarely been better, and with the announcement that President Eisenhower will run again, businessmen put expansion plans into full swing.

Spending for new construction put in place in February equalled the record set for the same month last year—$2.7 billion, and more money was spent for highways, schools, and sewer and water installations than in any previous February.

Continuing the upward trend, contract awards for new construction were heavy, and in some areas heavy-construction awards were running about 50 per cent ahead of 1955. The House Ways and Means Committee approved a pay-as-you-go financing plan for the modernization of the Interstate Highway System. By raising gas taxes one cent and by increasing excise taxes on trucks, buses, trailers, tires, and camelback, the bill would raise $13.7 billion over a period of 16 years.

An annual licensing fee of $1.50 per 1,000 pounds for trucks weighing more than 13 tons was also called for. The tax bill must be joined to the authorizing bill, which was making slow but steady progress in the House Public Works Committee.

Residential completions, slack at the beginning of the year, have begun to pick up.

ON EVERY OFF-THE-ROAD JOB . . .

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Spokesmen for the AEC declared in recent congressional hearings that by 1960 electricity in many homes and factories should be provided by atomic power. Permits to construct nuclear-reactor electricity plants will be issued soon to eight firms, including the Commonwealth Edison Co. of Chicago and the Consolidated Edison Co. of New York. Plans call for building a plant in each area.

In addition, the AEC has accepted the Yankee Atomic Energy Co.'s proposal for negotiations on building a 134,000-kw plant at Rowe, Mass. Builders of all three plants hope to complete work by 1959 or 1960.

One of the biggest stumbling blocks, oddly enough, is a question of insurance, not of technology.

Although atomic experts claim that the danger of an explosion is remote, it is possible that an accident could spray radioactive material over a wide area and cause millions of dollars' worth of damage to property and lives.

A panel of citizens has opposed any federal participation in an atomic insurance program, even though industry claims it needs help. A witness from General Electric Co. testified that private insurance firms are unwilling to go far enough in underwriting atomic damage, fearing that one major disaster would wipe out not only the company's assets, but the stockholders' investments as well.

Sen. Clinton Anderson, (D.-N. Mex.), holds that the government, as a supplier of the reactor fuel, would be liable for damage claims in excess of what the plant operator could pay.

A new booklet from the Department of Commerce tells how to go about bidding on construction jobs in countries belonging to the North Atlantic Treaty Organization. The Bureau of Foreign Commerce of the Department of Commerce in Washington, D. C., is distributing the pamphlets to all interested in the NATO bidding program.

An Air Force order requiring the use of concrete for the full length of new airport runways, and not just for warm-up pads and fueling areas, has been approved by the Defense Department. The contention of some Air Force officers that fuel spillage and jet blasts dissolve and disintegrate asphalt binder is being fought by the Asphalt Institute. The Institute has even sent out field engineers to survey fields where the Air Force says that asphalt has proved unsuitable.

The highway financing plan worked out by the House Ways and Means Committee is running into opposition —this time from the trucking industry. The plan, which would increase gasoline, diesel oil, and tire taxes, as well as making an extra levy on trucks weighing more than 26,000 pounds, is being called "discriminatory" by the American Trucking Associations, Inc. However, the Bureau of Public Roads, in a report on the plan, said that payments being made by heavy diesel trucks and buses are smaller than those being made by light, gasoline-powered vehicles, and that the bulk of highway financing will have to be borne by automobiles and light trucks. The report states that since diesel engines use about one-third less fuel than gasoline engines, the tax burden on diesel-powered vehicles is much less than on the lighter vehicles.

The Interstate Commerce Commission, in its annual report to congress, has recommended that 39 changes be made in existing laws regulating interstate surface transportation. One of these changes calls for all private carriers to be registered with the commission so that safety regulations can be better enforced. The ICC feels that unless some kind of registration is authorized, the commission will have no way of knowing which carriers are subject to service and safety requirements, under the Interstate Commerce laws, making its task in this area more difficult. THE END

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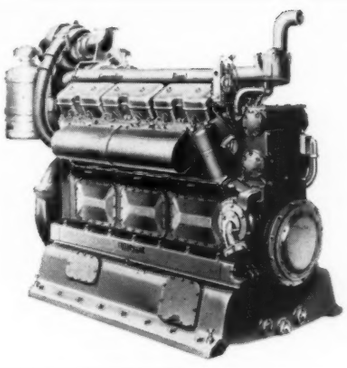
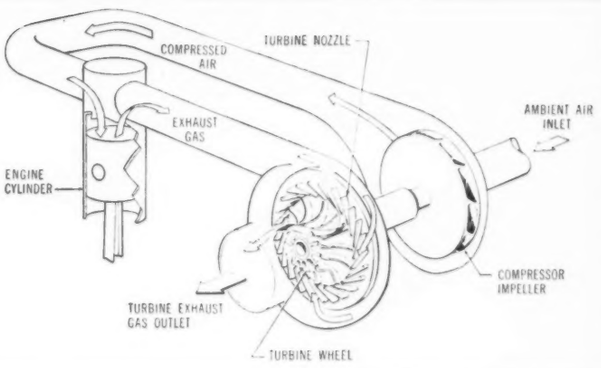
Compact, modern heavy-duty diesels for greater power, efficiency and economy!





The Cat D397 Turbocharged Engine
Both the D397 and the D375 are also available as *roots blown, naturally aspirated or spark ignited* engines.

The Turbocharger . . . Exhaust Gas and Air Flow
Another example of Caterpillar leadership in action! The Turbocharger, driven by the engine exhaust, utilizes energy which would otherwise be lost. It packs air into the engine according to engine load for greater efficiency.

As shown in the diagram above, engine exhaust gases turn the turbine, which drives the compressor . . . the compressed air then enters the cylinders. Final result: more power on less fuel.

More than eighteen years of research have gone into these two new CAT* Turbocharged Diesels. Incorporating metallurgical, mechanical and aerodynamic advances, they are engineered to deliver higher horsepowers and lower operating costs at reduced noise levels. Their advance-design features are also available in D397 and D375 Electric Sets and Marine Engines.

With these engines in the Caterpillar line-up, you now have an even wider choice of compact, modern heavy-duty power to meet your requirements. Get the complete facts about these two new Turbocharged Diesels from your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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MODERN HEAVY-DUTY DIESELS

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No more broken plows on this boulder . . .

New Michigan Turbo-Dozer roots out buried 2-ton boulder

When these pictures were taken, the 2¾-yd. Michigan Turbo-Dozer had just finished clearing some wooded farmland to open up more acreage for cultivation. The farmer asked the Turbo-Dozer operator if he'd try to remove a certain boulder which lay completely buried in the wet loam—he'd broken two plow blades on it. This job—which took the Turbo-Dozer 5 minutes—illustrates what you can do with the Michigan's exclusive power-tilting bowl.

Compare this photo with the large picture. Here the boulder has been brought up to the surface, and the operator has tilted the bowl forward to "float" position to carry it away.

Cut and pry with bowl

Two lateral cuts on the front and back sides of the boulder exposed approximately six inches of stone. Then, crowding in against it, the operator hooked the cutting-edge of the bowl under a projection on the stone—and worked the bowl back and forth through a 33 degree arc to pry it loose. When the boulder loosened, he crowded forward as he raised the bowl—literally *lifted* and pushed the boulder out of its hole.

Full power on all wheels

In addition to its power-tilting bowl, the new Turbo-Dozer features rear-wheel steering: even on turns, *you maintain full power on all four wheels,* except when you declutch the rear axle for highway travel. The 165 hp turbo-charged diesel engine drives through 3-to-1 torque converter, power-shift transmission and planetary-wheel drive axles. This power-train is stan equipment on the Turbo-Dozer: speeds forward and reverse, top s 27 mph.

20-page photo booklet

You'll find a full description of power-tilting bowl, C-frame, po train and specifications in a 20-p photo booklet—write for a copy. new Turbo-Dozer combines rub tired speed with outstanding trac and power—28,000 lbs. maximum pull, on 18.00-25 low pressure tire optional 23.5-25. For faster cycles, m yardage or tonnage in every shift, ta look at the new Michigan Turbo-Do

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